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# Thilmany Co. Purchases Sangamon Property

## Remains of Mill Destroyed By Fire In 1944 Will Be Razed and Land Held For Future Expansion — Northwest Superintendents Meet — Favor Keeping Manpower Controls — Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., June 4, 1945—Thilmany Pulp and Paper Company, Kaukauna, Wis., has purchased the building and property formerly owned by the Sangamon Paper Company in that city, mill officials announced last week.

Remains of the Sangamon mill, which was destroyed in February, 1944, by fire, will be razed and the ground will be leveled. Thilmany will hold the property for future expansion, officials asserted.

The property originally was sold in 1868 to William H. Norris, Jr., the records show. Mr. Norris sold to the Chicago and North Western Railway Company in 1875, and the property was purchased in 1886 by Henry Hewitt, Jr. In February, 1887, the original building was erected by the Outagamie Pulp and Paper Company.

Since that time the paper mill was owned by the Patten Paper Company, which ceased operations during the years of the depresion, when the property was taken over by the Utilities Commission of the city of Kaukauna. The commission used the water rights to build a power plant. The mill was sold to the Sangamon Paper Company in 1940, which operated it until the time of the fire.

### Favor Keeping Manpower Controls

Wisconsin labor and management representatives are 100% in favor of retention of War Manpower Commission controls in all labor market areas in Wisconsin, according to William E. O'Brien state WMC director, until July 1 or as long thereafter as is necessary. The controls include the employment ceiling program, limiting the number of workers an employer may have on his payroll over a given period; and the priority referral system, which provides that all workers, men and women, must be hired through the United States Employment Service or an authorized referral agency.

Among members of the labor-management committee in the Appleton area are S. F. Shattuck, vice president of Kimberly-Clark Corporation, Neenah, and Joseph W. Siebers, trustee and past president of Thilmany Union Local 147, Kaukauna.

### Allis-Chalmers Announces New Barker

Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has announced the successful application of a hydraulic log barking device. A demonstration was given recently through the cooperation of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., on a carload of west coast woods before representatives of a number of pulp and paper mills. Consolidated has installed the first Allis-Chalmers Streambarker in the Great Lakes area.

The hydraulic barker operated successfully on Douglas fir, white fir and west coast hemlock, ranging from 3 to 12 inches in diameter, at the rate of more than 10 cords an hour.

Herbert K. Swan, manager of the Allis-Chalmers milling and extraction section, and Robert K. Prince, Allis-Chalmers cellulose engineer, asserted after the test that the Streambarker is applicable to the program of salvaging tree tops, branches and small trees on the west coast up to a diameter of 18 inches.

Among companies represented at the demonstration were the Weyerhaeuser Timber Company and Longview Fiber Company, both of Longview, Wash.; Crown-Zellerbach Corporation, San Francisco, Calif.; Marathon Corporation, Rothschild, Wis.; Thilmany Pulp and Paper Company, Kaukauna, Wis.; Northern Paper Mills, Green Bay, Wis., and the Munising Paper Company, Munising, Mich.

### Paper Institute Class Starts

Regular class work began Monday, June 4, for five new students at the Institute of Paper Chemistry, Appleton, Wis. The five returned Saturday, May 26, from a conducted tour of northern Wisconsin, to acquaint them with the sources of pulpwood. They were guests of lumber camps, talked to forest rangers, learned about conservation and forest fire fighting.

Dr. Irving Isenberg, Sidney Wells and Dr. J. Edward Todd of the Iistitute staff accompanied them. Dr. Todd is assistant to the dean, Dr. H. F. Lewis.

The new students are: Alfred A. D'Addieco, East Boston, Mass., graduate of Tufts College, Boston, with a B.S. degree; Robert J. Hlavacek, Oak Park, Ill., graduate of Lawrence College, Appleton, Wis., B.A. degree; Leon Lapidus, Syracuse, N. Y., Syracuse University, B.S. degree in chemical engineering; Donald O. Oyen, Corning, N. Y., Syracuse, B.S., chemical engineesing; and Ellsworth H. Shriver, Raleigh, W. Va., Ohio State University, B.S., chemical engineering.

Last week the students listened to a series of lectures on the general background of the paper industry by John Strange, who discussed the Institute and its functions, the paper industry and its future; Dr. Lewis, who discussed the academic program; Dr. Loren Forman, who spoke on the place of the techni-

*(Continued on page 22)*

# New U. S. Forestry Plan Interests Canada

## Nine-Point Program Impresses Industry In Dominion As It Consolidates Efforts of Many Forest Products Manufacturers In Unified Campaign — Hardwood Versus Softwood — Other Mill News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 4, 1945—Much interest has been aroused here by the article in the PAPER TRADE JOURNAL describing the new nine-point forestry program for securing increased reproduction and growth of U. S. forests and more efficient management of woodlands, adopted by the newly-organized Forest Industries Council, representing members of the American Paper and Pulp Association, the American Plywood Association, and the National Lumber Manufacturers Association.

What particularly impresses operators in the forestry industries here is that, in arriving at the comprehensive and far-reaching decisions in the nine-point program, producers of over two-thirds of all U. S. forest products have crossed boundary lines for the first time and joined forces in initiating a national drive. This fact, it is conceded, will strengthen the hands of forest conservationists here, and will probably do much to bring about a similar consolidation of interests in Canada, where lumber and pulp and paper producers have competitive interests in forest exploitation. This competition has been more strongly evident than ever during the war, owing to the abnormal demands for lumber on the one hand and for pulp and paper products on the other, and undoubtedly it will continue as the result of new war-inspired industries for the manufacture of veneers, plywood, and wood-based plastics, to say nothing of the new and enormous paper container industry.

To date the most notable work in bringing about identity of interest and action as between lumber and pulp producers has been done by the Canadian Forestry Association, which has been carrying on elaborate and intensive educational work on a national scale for furthering forest conservation and the adoption of rational methods of forest management, especially in relation to cutting methods and the replanting of waste and cut-over lands. Both lumber producers and the leaders in the pulp and paper industries have been doing much good work in their separate spheres along the same lines, and both have greatly extended and improved their separate trade organizations.

### Time Ripe for National Action

The time would now seem to be ripe for a crossing of the boundary lines between all producers of forest products, similar to that which has now taken place in the United States, to secure solid and integral action on a national scale.

So far public attention and the activities of legislative bodies have been mainly focussed on the need for greater protection from fires and destructive insects and fungoid growth, which annually devastate vast areas of forests. It is claimed, however, that of equal importance is the raising of standards in cutting methods and in forest management generally, which, though being constantly improved, still result in much waste.

For instance, it has been claimed that for every tree cut and taken out of the woods from 20 to 30 young trees are destroyed and wasted. This is partly the result of the density of growth in forests allowed to grow up under natural conditions. The claim is also made that if the forests were managed on the scientific lines of European forest management, there would be a thinning out of the growth which makes such waste inevitable, and furthermore that this thinning out would result in a much larger crop of merchantable timber, as the annual growth would be so much more rapid that the standing trees would reach maturity in perhaps half the time they now take.

### Hardwood Versus Softwood

Some interesting points in regard to hardwood growing on timber limits on which cutting rights have been ceded to pulp and paper companies have been brought out in discussions in the Legislature on the bill which has been introduced for re-allocation of timber limits whereby exchanges may be made between companies and the government-held limits, so as to make raw material available to certain companies nearer to their mills and to facilitate other companies in securing hardwood supplies. Premier Duplessis explained that basically the bill made for better reallocation of the forest resources of the province, in that its purpose was to enable industries needing softwood to get it under better conditions, and those who needed hardwood to have facilities for doing so. This had not been done in the past so that some companies possessed immense forest limits where either the hardwood or the softwood was cut, but not both, with the result that much wood was left unutilized. Holders of such limits, he said, must not be allowed to let either hardwood or softwood rot on their limits.

### France Seeks Newsprint

Charles Herdt, the first business man permitted by the French Government to come to Canada, states that France is anxious to get supplies of newsprint and other manufactured articles from this country. Mr. Herdt is the director of L. G. Beaubien Banking Company, of Paris, whose clients have many Canadian investments. He states that the Germans obliged his company to remain open during the German occupation, on the ground that the company would be needed to deal with French Canada "after the Germans had conquered North America."

### Appeals for More Waste Paper

War Services Minister McCann, in an announcement from Ottawa, said, that victory over Germany has not ended Canada's shortage of waste paper and appealed to voluntary salvage committee members across the Dominion to keep up their work in supplying paper mills with all the waste paper they can get.

"The immediate demands of the armed forces are as imperative as ever," he said, "and we must now take into consideration the future requirements of the liberated countries. Containers are needed which can only be furnished if waste paper in sufficient quantity is made available to the mills for their manufacture."

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June 7, 1945

# Midwest Struggles With Short Paper Supply

## Quota Method Aids Distribution of Book and Cover Papers But Kraft and Sulphite Lines Are Very Short—Salesmen To Entertain Veterans — Paper Salvage Is Increasing — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., June 4, 1945—The short week, because of Memorial Day failed to lessen the problems of Chicago distributors and sales offices who reported a continued problem to serve the civilian part of their business. There were indications that the third quarter of the year might show some brightness here and there and some expectations that the pulp situation, through Canadian efforts, would prove helpful. Meanwhile, all "military papers" were being stringently concentrated into military usage with local distributors finding it increasingly hard to find substitute grades for domestic trade which was booming locally. The biggest "cut in" in the shift to the new theater of war operations, is reported in the board field where the pressure for more and more shipping cartons and set-up boxes is said to be "terrific."

Book and cover markets here were doing a surprisingly good job of satisfying Chicago customers through the quota system which the trade is taking in gratifying fashion. All grades of sulphites were similarly months and months behind in orders as were all grades of krafts. There was some talk of a more plentiful supply of heavier mimeograph paper late in the Fall or early Winter. Waste paper supplies, said the salvage interests here, were still inadequate in supplying mid-western mills even though local salvage drives were breaking records right and left as far as collections are concerned. The price "squeeze" continues to be a worry in many grades but there seems to be a definite conviction that controls are vitally necesary to the industry for some time to come.

### Salesmen To Again Entertain Veterans

The western division of the Salesmen's Association will again entertain wounded War veterans from Vaughan General Hospital at their regular Monday noon meeting at the Hotel Sherman on June 25. The first of such occasions, held a few weeks ago, proved a high light in the SAPEYES "open meeting" program and a big crowd is expected to be on hand to honor the veterans. On May 27 the western division took a look at the past, present and future of commercial aviation as Miss Helen Olson, presenting the United Air Lines, gave the script and exhibited color slides showing the progress of aviation from 1931 up to date, the plans for the next five years and the post-war period and a prospectus of what the entire air program might be like twenty years hence. The program was secured through the dual cooperation of Clarence Hodlmair of the Nekoosa-Edwards Paper Company and Ben Babbitt of the Brown Company. About fifty sales executives and their guests were present. The western division is also all set for its first golf outing of the season to be held at the Park Ridge Country Club on Friday, June 15.

### Collects Paper To Aid Hospitals

Something new had been added to the long list of efforts which lend impetus to waste paper salvage drives. This week a Chicago high school, having "adopted" Downey Veterans Hospital for its waste paper drive, turned over to hospital representatives a part of the $700 worth of athletic equipment it expects to buy from the sale of scrap paper. Thus the local high school, Amundsen, becomes the first in the country to donate paper campaign proceeds to hospitals for athletic equipment. The Chicago Newspaper Publishers Association and the War Production Boards local salvage committees are asking the paper industry and other groups to publicize the high school program as an idea that should spread throughout the country and which will not only expedite waste paper collections but insure use of funds for very worthwhile purposes.

### Waste Paper Salvage Gains

For the highest per capita collection of waste paper in any vocational school in the country in the last two months, Washburne Trade School of Chicago was awarded a No. 1 WPB citation at the time of the school's Memorial Day exercises. March collection figures were said to be 118,364 pounds and April totals reached 127,360 pounds, bringing a total of 235,742 pounds in the last two months or a per capita average of 235.7 pounds for the 1000 pupils of the school. Members of the Chicago Newspapers Waste paper committee,, of the War Production Board and the waste paper industry in this area participated in the ceremonies.

### R. H. M. Robinson Made Chairman

R. H. M. Robinson has been elected chairman of the board of the Minnesota and Ontario Paper Company, and Donald D. Davis was elected president, according to press reports.

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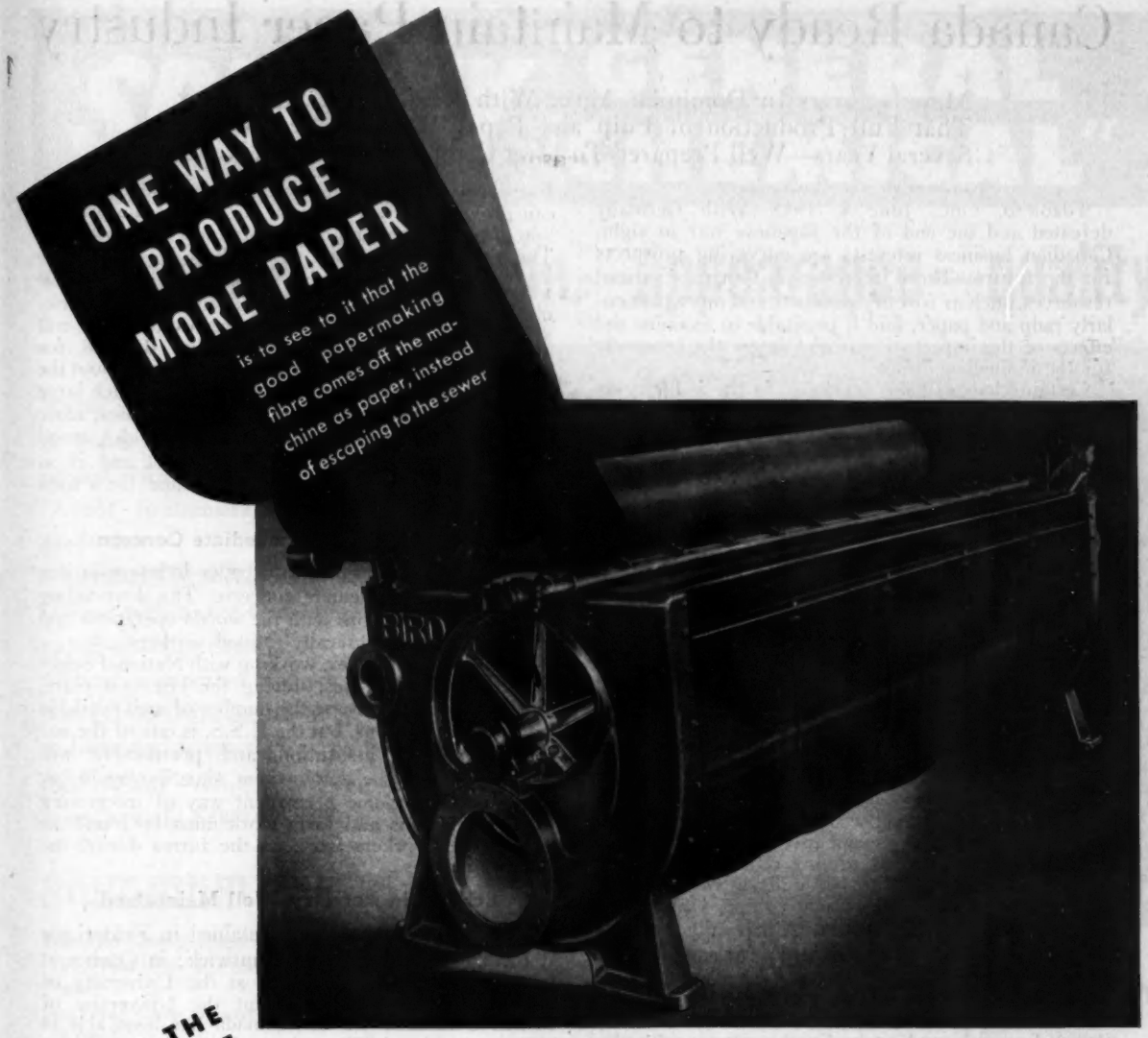
## Mathieson Promotes Vincent, Gage

G. P. Vincent, manager of the sales development and technical service department of the Mathieson Alkali Works, has been appointed to the newly created position of technical director. In addition to his former duties, he will direct research and technical development and advise on technical matters concerning plant operation. In these latter capacities, he succeeds R. E. Gage, who was director of research and development for Mathieson for fourteen years and has now been appointed technical advisor of the company.

Among the developments for which Dr. Vincent is known are his invention of the commercial process of manufacturing sodium chlorite and his contributions to the development of means for the safe production and control of chlorine dioxide. He is also responsible for many of the practical applications of these and other Mathieson products in the textile, pulp and paper, food, water supply, and other fields.

Mr. Gage, as technical advisor for Mathieson, will cooperate with the technical director in various lines of research and development. He is a native of Palmer, Massachusetts, and a graduate of the Massachusetts Institute of Technology, where he majored in chemistry and chemical engineering.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# Canada Ready to Maintain Paper Industry

## Manufacturers In Dominion Agree With Results of U. S. Survey That Full Production of Pulp and Paper Will Be Needed For Several Years—Well Prepared To Meet Competition—Other News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., June 4, 1945—With Germany defeated and the end of the Japanese war in sight, Canadian business interests are surveying prospects for the future. Those interested in Canada's natural resources, such as forestry products and more particularly pulp and paper, find it profitable to examine the effects of the impact of war and assess the prospects for the immediate future.

Certain changes have developed in the industry as a result of wartime requirements. First of all, the rapid strides made in widening the uses of pulp and paper during the war indicates tremendous future potentialities for the industry generally. Where does Canada stand in relation to these new developments?

### Dominion Capacity is Large

Dissolving pulps, from which are made so many products, from explosives to plastics, and the many new ways of treating paper for new uses, will all add to the total basic demand.

Canada is in the forefront in production of wood pulp, ranking second only to the United States. Her exports of wood pulp jumped from 559,000 tons in 1938 to around 1,600,000 tons in 1944. Canada leads the world in mill capacity for the production of newsprint with more than four and a half million tons a year—equal to the combined capacity of the United States, Britain, Norway, Sweden and Finland. Ninety-four percent of her newsprint production is exported, the value exceeding that of any other export commodity except gold. With her mills w rking at less than 70% capacity in 1944, Canada shipped more than three million tons of newsprint. A half million Canadians are dependent on this industry for employment. Pulp and paper is Canada's largest manufacturing industry. Its stability and well being is essential to Canadian business.

Canadian pulp and paper interests agree with the results of a study by the U. S. Department of Commerce whcih indicates that full production by practically every facility available and usable in the world for the manufacture of w od pulp and paper will be needed in the first three post-war years to meet world demands. Beyond that period it is more difficult to predict what will happen. Will Russia subsidize forest products exports? Will a newsprint industry be developed in Alaska?

### Canada Prepared To Meet Competition

Canada is prepared and confident that she can meet successfully competition, on any straight competitive basis, from anywhere. She has large resources of wood favorably situated; large low-cost water power resources; many good waterways available for getting the wood to the mills; both Atlantic and Pacific ports. She has 430,000 square miles of accessible wood, of which 174,000 miles are already leased for commercial purposes.

A recent issue of "Trade and Commerce," organ of the Canadian Department of Commerce, says: "If wise policies are adopted to reduce wastage through fires, insects, and tree diseases, and to encourage good forest management in general, the Canadian forests can provide the raw material for large-scale production of pulp, paper and related products in perpetuity." The paper goes on to say: "For the immediate post-war period, Canada's problem would appear to be not one of demand, but of supply. As restrictions on the use of paper are removed, there will undoubtedly be a steadily increasing demand for newsprint and other papers and boards throughout the world. While pulp may not be required in such large volume for explosives and other war purposes, more of it can be transformed into paper. Besides, wood cellulose is the cheapest known product and is so versatile that it should be in great demand for a wide variety of peacetime uses."

### Two Problems of Immediate Concern

Two things in the pulp and paper industry in this country are of immediate concern. The dove-tailing of other seasonal work with the woods operations and the retension of technically trained workers.

Pulpwood committees, working with National Selective Service authorities, during the last two years, have been able to increase the number of men available for woods operations, but the N.S.S. is one of the numerous war-time institutions and, presumably, will disappear when the employment situation again becomes normal. Some permanent way of integrating woods operations and farm work must be found, as most woods workers work on the farms during the summer months.

### Schools in Forestry Well Maintained

Schools in forestry are maintained in Fredericton at the University of New Brunswick; in Quebec at Laval University; in Toronto at the University of Toronto; and in Vancouver at the University of British Columbia. So far, Canada has been able to keep most of her 1,000 graduates in forestry engineering at home, but the depletion of U. S. schools by the draft, it is feared, may attract some Canadian graduates. Both civil service and industrial salary levels are higher in the United States. A hopeful feature is the fact that enquiries and applications for admittance to all forestry schools in Canada have been increasing. It is pointed out that whether or not Canada loses forestry graduates, her own need of such technicians in provincial administration and industrial woods operations has increased to the point where longer-term expansion of at least some of the schools seems likely. In the four accredited schools in Canada the scope of forestry education has been widening in recent years. The more progressive forestry curricula now include such courses as wildlife management, recreational land use, camp administration, forest structures and improvements, forest accounts and records, lumber salesmanship, wood preservation, dry kiln engineering, wood gluing and laminating, wood and cellulose chemistry, celluose technology, wood plastics and aerial mapping and public administration. Governments of those chief Canadian forest provinces are promoting or have plans to promote training on the vocational level as well.

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# Paper Prices Are Out of Line

By E. W. Tinker, Executive Sec., American Paper and Pulp Association

The Office of Price Administration has allowed increases in raw material prices and, following its usual procedure, has attempted to suppress advances in the price of the finished product. This has created an anomalous situation because there has been an increase of 50% in labor costs per ton of paper which, in addition to the raw material increases which have been allowed by the Office of Price Administration, appear to lead to the necessity for some definite remedial action. There must come a time, if it has not already passed, when increased costs of raw materials and increased compensation for labor, add up to the point where in all equity the manufacturer of paper must have some relief. I repeat that the situation has only been possible because the manufacturers, in an effort to survive, have increased production, partially through patriotic motives and partially because it was the only thing they could do and continue to exist. Allowance of a survival incentive has been cold comfort in view of depreciation and obsolescent factors that have not yet appeared in the picture but that will be very real after the war. It is a fact that labor costs per ton have advanced 50% and also that average weekly wages have advanced far more than the advance in cost of living. If, as is contended by many, the "take-home pay" should be the controlling element rather than weekly wages, then by the same token, net profits after taxes should be the criterion for the manufacturer, and these have been steadily declining since 1941.

We have seen an unusual economic phenomenon in this industry since 1941; that is a steady increase in sales accompanied by an equally steady drop in profits. This is the fundamental reason for my fear that if the present trend is allowed to persist serious production difficulties will result.

The accompanying chart shows a split-up of the Bureau of Labor Statistics Index into its components, Paper, Pulp and Paperboard.

For purposes of comparison we have added the all-commodity index of wholesale prices of the Bureau of Labor Statistics. Taking August 1939 as the base for all of these indexes, the all commodity index rose above the paper index early in 1941 and has been above it ever since. The relative position, February 1945, is:

| | |
|---|---|
| all commodity | 140.2 |
| paper | 120.1 |

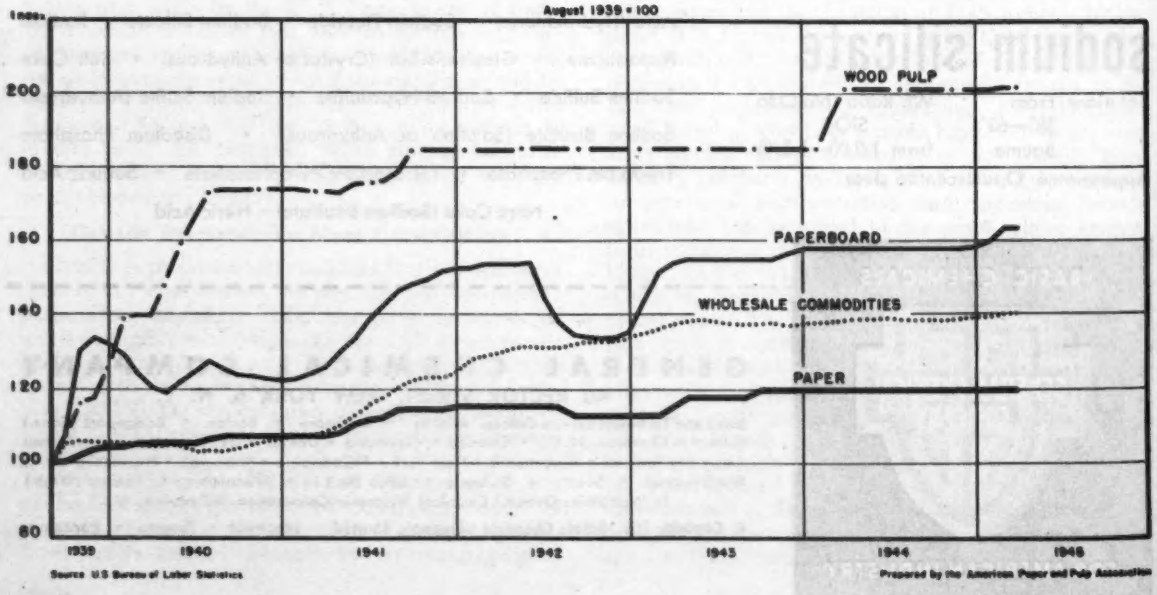
Thus, since August 1939 the paper price index has increased only 20 index points while all commodity prices have been rising 40 index points.

If the changes since October 1941 are considered, the difference is relatively greater. In October 1941, the paper index stood at 115.1 and the all-commodity index at 123.1. Thus the paper price index has risen 5.0 index points, and the all-commodity index has risen 17.1 index points, or more than three and one half times the paper increase during this period of so-called price stabilization.

I do not wish to be understood to be opposing the increases in pulp and paperboard prices. All my information is to the effect that the increase so far granted in pulp prices has been justified; in fact it has been less profitable than other products of the industry. The profit position of both market mills and integrated mills has not been encouraging on a comparative basis. The fact that a large volume of pulp is imported may have been a factor in the increases allowed on wood pulp ceiling prices under the Office of Price Administration formula. That present wood pulp ceiling prices are not excessive seems to be confirmed by the recent discussion of price ceilings with the Scandinavian pulp producers.

But I am still convinced that paper prices are out of line as compared with the general price levels.

**INDEX OF PULP AND PAPER PRICES RELATED TO WHOLESALE COMMODITY PRICES**




Source: U.S. Bureau of Labor Statistics

Prepared by the American Paper and Pulp Association

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## TAPPI Plastics Committee Meets

The newly fomed Plastics Committee of the Technical Association of the Pulp and Paper Industry held a meeting at the New York State College of Forestry in Syracuse, N. Y. on May 15 and 16, 1945. Professor E. C. Jahn, chairman of the committee, introduced the papers; the program being that which was originally scheduled for the Plastics Session of the 1945 Annual Meeting of the Technical Association which was cancelled. All papers have appeared or will appear in the Technical Section of the PAPER TRADE JOURNAL.

After the presentation of "Identification of Melamine and Urea Resins in Wet Strength Paper" by R. W. Stafford, W. M. Thomas, E. F. Williams, and N. T. Woodberry, American Cyanamid Company and "A Study of the Melamine Resin Process for Producing Wet Strength Paper" by C. G. Landes and C. S. Maxwell, American Cyanamid Company, a general discussion was held on the subject of wet strength papers.

Other papers presented during the session were: "Laminants and Coating for Papers, Plastic Films and Metal Foils," Fred Speyer, American Resinous Chemicals Corporation; "The Use of Various Papers in Paper Laminates," Robert W. Barber, Panelyte Division, St. Regis Paper Company; "Pulps for Pulp-Reinforced Plastics," S. L. Schwartz and J. C. Pew, Forest Products Laboratory, presented by R. J. Seidl; "The Preparation and Applications of Pulp Preforms," R. H. Mosher, N. T. Samaras, and L. M. Debing, Monsanto Chemical Company; "Fabrication and Properties of High-Strength Laminated Paper Plastics," G. H. Chidester and P. K. Baird, Forest Products Laboratory, presented by R. J. Seidl; and "Paper Base Laminates for Electrical Insulation," L. B. Larsen, General Electric Company.

A discussion was held following the presentation of each of these papers. It is expected that a complete record of the session will be made available sometime in the future.

Tuesday evening, May 15th, the group met at the Hotel Syracuse for dinner at which time Dr. J. S. Illich, Dean of the New York State College of Forestry and Dr. W. P. Tolley, Chancellor of Syracuse University spoke on the industrial aspects of forestry education and the relation of the university to industrial research.

At the close of the session Wednesday all were invited to inspect the Pulp and Paper Laboritories at the College.

Those who attended the meeting were as follows: R. W. Barber, H. T. Barker, R. T. Bingham, K. W. Britt, H. E. Brockett, E. B. Brookbank, H. P. Brown, John B. Calkin, L. C. Chesley, Jr., R. C. Crain, A. H. Croup, H. E. Duston, I. V. Earle, J. A. Feola, Carl C. Forsaith, George E. Fromm, Orwell H. Gepp, R. G. Goodwin, F. P. Hall, William M. Harlow, W. F. Hathaway, E. B. Headden, Walter S. Hendrick, Ray R. Hirt, R. A. Holcombe, W. H. Hough, T. A. Howells, A. E. Holstein, Dr. Joseph S. Illick, D. T. Jackson, Edwin C. Jahn, C. W. Johnson, G. I. Keim, George Kitazawa, Max Krimmel, Ralph W. Kumler, Chester G. Landes, L. V. Larsen, C. E. Libby, H. W. Mackinney, C. W. MacMullen, George V. N. Morin, C. G. Morse, R. H. Mosher, Charles S. Maxwell, C. R. McCrosky, R. L. McEwen, John J. O'Brien, A. W. Oliner, A. F. Owen, D. G. Patterson, M. W. Phelps, R. T. Raleigh, Fred R. Ramage, L. P. Rankin, P. M. Rouff, William Schroeder, John Schuber, R. J. Seidl, Gordon Smith, L. A. Sontag, C. C. Spencer, F. B. Speyer, R. W. Stafford, William P. Stillman, W. Clinton Tasker, Dr. William P. Tolley, H. F. Wakefield, L. H. Wilson, W. S. Wilson, Anthony J. Wirpsa, Norman T. Woodberry.

## French Resigns As AFPI Chief

WASHINGTON, D. C., June 5, 1945—The resignation of Charles R. French as public relations director of the American Forest Products Industries, Inc., of Washington, D. C., has been made known by Corydon Wagner, Tacoma, Washington, chairman of the organization's administrative committee.

Mr. French, who has headed the public relations program of the forest industries since 1941, plans to start his own advertising business in Washington. Previously, he was associated with the National Lumber Manufacturers Association for many years. His resignation became effective on June 1.

At the same time, Mr. Wagner announced the appointments of Chapin Collins as Washington manager of American Forest Products Industries and of M. O. Chenoweth as manager of the New York office. Mr. Collins, for many years a newspaper publisher in Washington State, served in the army before joining the staff of American Forest Products Industries. Mr. Chenoweth has been a New York newspaperman for many years.

## Chicago Paper Group Elects Officers

CHICAGO, May 21, 1945 — At a well attended meeting of the Chicago Professional Paper Group May 21, members and guests were shown the graphic arts film, "The Material Side of Printing." This presentation was sponsored by the Young Printing Executives Club of New York and runs for a full 1½ hours.

Before the presentation of the film, officers for the ensuing year were elected. These are as follows: Harry E. Weston of Fritz Publications, Inc., president; F. D. Long, Container Corporation of America, vice president; Arnold McAneny of Bradner-Smith, treasurer; V. V. Vallandighan of Calco Company, secretary.

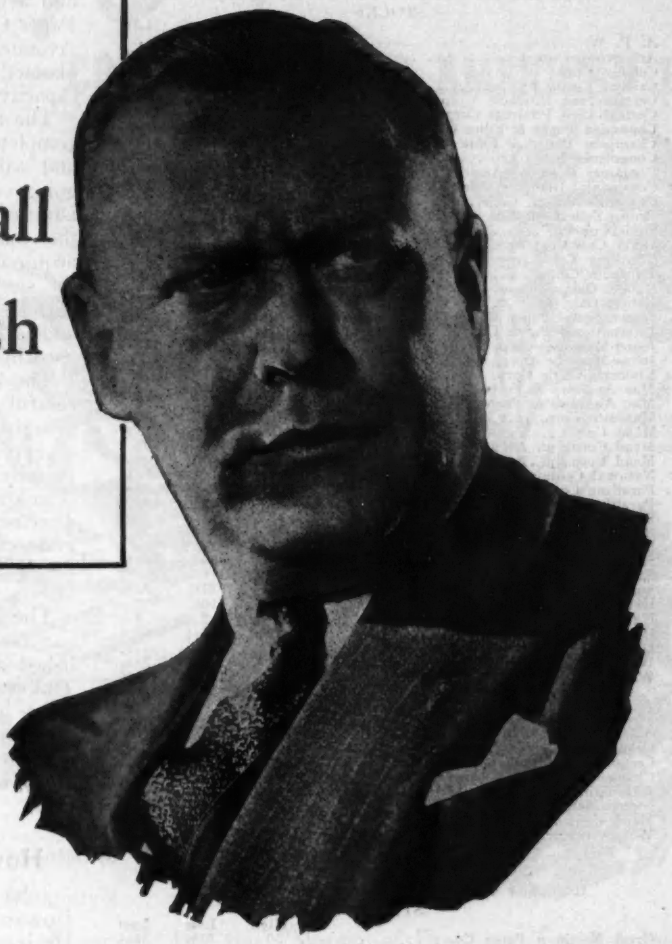
## Boston Trade Postpones Outing

BOSTON, Mass., June 4, 1945—At a meeting of the executive committee of the Boston Paper Trade Association, it was unanimously voted "that the Summer Outing, usually held in June, should be postponed because of restrictions on gatherings and the difficulties of travel." A notice to the members from President Matthew O. Byrne and Secretary Frank B. Cummings says also: "If, as we hope, these conditions improve sufficiently in the next three months, it is quite possible that an outing can be held in the early fall, due notice of which will be sent you. This decision is in line with and supports the urgent request of President Truman."

## McClure Firm Opens New Office

BOSTON, Mass., June 4, 1945—Frank N. McClure, Inc., paper and grocery wholesalers, said to be the oldest food concern in Southern Massachusetts, has opened an office at 581 Boylston street. It is prepared, President J. N. McClure said, to provide complete coverage to wholesale merchants in New England. Founded in 1895 in Fall River, Mass., the firm once had 15 stores from Boston to New Haven.

# "what! you mean I can't buy all the Soda Ash I want?"



YES, MR. INDUSTRIALIST, that's the situation on Soda Ash . . . as long as present heavy war demand continues.

Too often this basic "work-horse" of industry is taken for granted. Yet Soda Ash is absolutely indispensable in a wide variety of industrial processes.

What has happened to all the Soda Ash? It has gone into vastly expanded production of glass containers to save scarce metals. Into the manufacture of aluminum and other metals vital to war production. Into the making of explosives. Into the manufacture of chemicals, pulp and paper, textiles, soap and soap powders, water softeners, cleansers and literally hundreds of miscellaneous materials.

Despite war's complications, alkali manufacturers have set an enviable record in supplying the steadily expanding Soda Ash requirements of industry. And Mathieson, playing no favorites, has followed a policy in its commitments of "cutting the cloth to fit the pattern", is continuing to take care of its contract customers, large and small, with little or no occasion for late deliveries or other disappointments . . . regrets only that its production facilities have not been great enough at all times to serve all potential Mathieson customers.

Yes, Mr. Industrialist, if they ever start pinning medals on industrial products for valiant war service, Soda Ash will sport a chest full! Think of that if you haven't been able to buy all the Soda Ash you want!

**Mathieson**
CHEMICALS

**THE MATHIESON ALKALI WORKS (INC.)**
60 East 42nd Street, New York 17, N. Y.

Soda Ash ... Caustic Soda ... Liquid Chlorine ... Bicarbonate of Soda ... Chlorine Dioxide ... Ammonia, Anhydrous & Aqua ... HTH Products ... Fused Alkali Products ... Synthetic Salt Cake ... Dry Ice ... Carbonic Gas ... Sodium Chlorite Products ... Sodium Methylate

# FINANCIAL NEWS

### New York Stock Exchange

High, Low and Last for Week Ending June 2, 1945

STOCKS

| | High | Low | Last |
|---|---|---|---|
| A. P. W. | .... | .... | .... |
| Armstrong Cork Co. | 48¾ | 47¼ | 48½ |
| Celotex Corp. | 17⅜ | 16¾ | 17⅜ |
| Celotex Corp., pf. | 20⅝ | 20¼ | 20¾ |
| Certain-Teed Products Corp. | 11⅜ | 10¾ | 10⅞ |
| Certain-Teed Products Corp., pf. | 155 | 153 | 155 |
| Champion Paper & Fibre Co. | 36 | 34¼ | 35⅞ |
| Champion Paper & Fibre Co., pf. | 113¼ | 113 | 113 |
| Congoleum Nairn Co. | 31¼ | 30 | 30¼ |
| Container Corp. of America | 30⅝ | 29¼ | 30⅜ |
| Continental-Diamond Fibre Co. | 12¾ | 11⅞ | 12¾ |
| Crown-Zellerbach Co. | 25⅛ | 24¾ | 25⅛ |
| Crown-Zellerbach Co., pf. | 103⅝ | 103 | 103⅝ |
| Dixie Cup Co. | 27⅜ | 26¼ | 26⅝ |
| Dixie Cup Co.—A. | 48½ | 47½ | 47½ |
| Flintkote Co. | 31½ | 30¼ | 30¾ |
| Flintkote Co., pf. | 108¼ | 108¼ | 108¼ |
| Robert Gair | 6¼ | 6 | 6 |
| Robert Gair, pf. | 17¾ | 17⅜ | 17¾ |
| International Paper Co. | 30¼ | 29 | 29⅛ |
| International Paper Co., pf. | 97¼ | 96 | 97 |
| Johns-Manville Corp. | 123½ | 118¾ | 123 |
| Johns-Manville Corp., pf. | .... | .... | .... |
| Kimberly-Clark Corp. | 48 | 47½ | 48 |
| Mac Andrews & Forbes | 33½ | 33½ | 33½ |
| Mac Andrews & Forbes, pf. | 155 | 152 | 155 |
| Masonite Corp. | 46⅞ | 46¼ | 46½ |
| Mead Corp. | 16 | 15⅜ | 15½ |
| Mead Corp., pf. A—6% | 102¼ | 102 | 102 |
| Mead Corp., pf. B—5½% | 100½ | 100 | 100½ |
| National Container Corp. | 16¼ | 15¾ | 15¾ |
| Paraffine Companies, Inc. | 69¾ | 65¼ | 69¾ |
| Paraffine Companies, Inc., pf. | 109 | 109 | 109 |
| Rayonier, Inc. | 18⅝ | 18¼ | 18⅝ |
| Rayonier, Inc., pf. | 36¼ | 35¾ | 36 |
| Ruberoid Co. | 39¼ | 39 | 39 |
| Scott Paper Co. | 51 | 50 | 50½ |
| Scott Paper Co., pf. | 112¼ | 111 | 112¼ |
| Sutherland Paper Co. | 33¼ | 33¼ | 33¼ |
| Union Bag & Paper Corp. | 17¼ | 16½ | 17 |
| United Paperboard Co. | 8 | 7⅞ | 8 |
| U. S. Gypsum Co. | 92 | 88¾ | 92 |
| U. S. Gypsum Co., pf. | .... | .... | .... |
| West Virginia Pulp & Paper Co. | 25⅞ | 25¼ | 25⅞ |
| West Virginia Pulp & Paper Co., pf. | 110½ | 110½ | 110½ |

BONDS

| | | | |
|---|---|---|---|
| Abitibi Pulp & Paper Co. 5s '53 | 107½ | 107 | 107 |
| Celotex Corp. 3¾s '55 | .... | .... | .... |
| Certain-Teed Products Corp. 5½s '48 | .... | .... | .... |
| Champion Paper & Fibre Co. 4¾s '50 | .... | .... | .... |
| International Paper Co. 6s '55 | 108½ | 106¾ | 106¾ |
| International Paper Co. 5s '47 | 104¾ | 104½ | 104½ |
| Mead Corp. 3½s '53 | .... | .... | .... |
| West Virginia Pulp & Paper Co. 3s '54 | .... | .... | .... |

### New York Curb Exchange

High, Low and Last for Week Ending June 2, 1945

STOCKS

| | High | Low | Last |
|---|---|---|---|
| Great Northern Paper Co. | 39 | 38¼ | 38¼ |
| Hummel-Ross Fibre Corp. | 8¼ | 8⅛ | 8⅛ |
| St. Regis Paper Co. | 5⅞ | 5⅝ | 5¾ |
| St. Regis Paper Co., pf. | .... | .... | .... |
| Taggart Corp. | 6 | 5¾ | 5¾ |

BONDS

| | | | |
|---|---|---|---|
| American Writing Paper Co. 6s '61 | 102 | 102 | 102 |

## Scott Co. Exchanges Shares

The Scott Paper Company has purchased all assets of the Automatic Paper Machinery Company in exchange for 136,840 shares of Scott Paper common stock.

This will bring outstanding Scott Paper common stock to 804,796 shares, leaving unissued 195,204 of the 1,000,000 authorized common shares. There are also outstanding 29,780 shares of $4.50 preferred stock and 30,000 shares of $4 preferred stock.

## American Box Board Votes Dividend

The American Box Board Company has announced a 50-cent dividend on the common stock, payable on June 15. A stock dividend of one common share for each ten shares held and a cash payment of 25 cents were distributed on Nov. 17, 1944, the only disbursement in that year.

## Westminster Starts $1,250,000 Expansion

[FROM OUR REGULAR CORRESPONDENT]

Difficulties in obtaining building materials and machinery are the only factors delaying the million and a quarter dollar expansion of the Westminster Paper Company Ltd. at its plant at the foot of Fifth Avenue, New Westminster, B. C. The development planned by the directors will more than double the capacity of the plant.

The new wharf for the company already is being completed by the Fraser River Pile Driving Company, and will provide direct loading facilities for ocean-going vessels at the plant. The new office and administration building will be erected across the road from the main plant on acreage which was recently acquired by the company. The firm is also taking over the site now used by the plant of the Fraser River Pile Driving Company to the west of the paper mills and is leasing a short street end from the city to be used in its expansion plans.

The Westminster company has been singularly successful in its operations in New Westminster even though the heads had to face a disastrous fire which occurred in 1929, practically gutting the plant. New premises soon rose from the ashes and these have been added to from time to time. In December, 1944, directors of the firm decided on an expansion program calling for an outlay of $1,250,000, in view of the bright prospects which the postwar world will offer.

The company was formed in 1922 by J. J. Herb and associates. Later a subsidiary company was established in Bellingham, the Puget Sound Pulp and Timber Company, where the premises have exceeded those in New Westminster. Mr. Herb remains as president of both concerns and is now living in Bellingham. His youngest son, Elmer M. ("Huntz") Herb, is general manager of the business in the Royal City.

## Howard Smith Appointed Controller

John R. Leslie has been appointed Controller of Howard Smith Paper Mills Limited and subsidiaries. He is a native of Toronto, and started his business career in the Imperial Bank of Canada in Hamilton, following which he joined the office staff of Gartshore-Thomson Pipe and Foundry Co. He saw service in the First World War with the Canadian Expeditionary Force. In 1919 he accepted a position with Lincoln Paper Mills at Merritton, Ont., and rose to the position of Controller and Treasurer of that company's successors, Lincoln Mills Limited, Lincoln Pulp and Paper Co., and Alliance Paper Mills Limited. He was loaned to the Allied War Supplies Corporation as from July, 1940.

Mr. Leslie's present executive positions are as follows,—Controller of Howard Smith Paper Mills Limited and Canada Paper Co.; Controller, Treasurer and Director of Alliance Paper Mills Limited and Don Valley Paper Co. Limited; Treasurer and Director of Lincoln Pulp and Paper Co. Limited and director of Cascapedia Booming Co.

Miss M. G. Peterkin, assistant secretary-treasurer of Howard Smith Paper Mills Limited, who retires this month after forty years' service, has been presented with a purse by Harold Crabtree, president of the company, on behalf of male staff members. She has also been feted by the ladies at a lunch in the Montreal Club, where she was presented with a set of travelling bags.

# *Sanitary Engineering*
## — CORNERSTONE OF AMERICAN HEALTH

Among the many factors that have contributed to good health in America is the average community's insistence on a pure water supply and an efficient system of sewage disposal. Sanitary engineering is, in fact, a cornerstone on which better standards of health are being built in this country and American sanitary engineers are among the most progressive in the world. Their pioneering experience and their specialized knowledge gained through years of planning and construction will serve them in good stead in the post-war period when new and finer public works will be built. They will be working in that "Margin of Experience" enjoyed by all pioneers and from which springs many new developments and improvements.

In every field of science, commerce and industry, this "Margin of Experience" proves again and again to be a factor vital to success. Niagara offers it in the field of electro-chemical products. For Niagara has pioneered constantly in the development, improvement and adaptation to new uses of Liquid Chlorine, Caustic Potash, Caustic Soda, Carbonate of Potash and Paradichlorobenzene. Rely on Niagara's "Margin of Experience" for greater success in the use of these products.

**AN ESSENTIAL PART OF AMERICA'S GREAT CHEMICAL ENTERPRISE**

*Niagara* **ALKALI COMPANY**

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CAUSTIC POTASH • CAUSTIC SODA • PARADICHLOROBENZENE
CARBONATE OF POTASH • LIQUID CHLORINE

ADVENTURES IN THE "MARGIN OF EXPERIENCE"

## Revises Wood Pulp Deliveries

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 30, 1945—Two major revisions involving the preferred status of deliveries and uses of wood pulp in the event of pulp deficiencies have been made in Direction 1 to Conservation Order M-93, the Pulp Allocation Office of the War Production Board announced today.

As in the past, pulp producers are required to complete deliveries to consumers other than themselves, in the event of a deficiency in their pulp supply, but the list of paper and paperboard items to which consumers must give preference in the event of a shortage is drastically curtailed through the elimination of all grades except containerboard, pulp allocation officials said.

This does not signify, however, that all other items of paper and paperboard are necessarily less essential than containerboard, they said. The Paper and Paperboard Division officials believe that other existing controls over the production and distribution of most essential items make it possible to give them preferential treatment without the necessity of maintaining them any longer on the list of Direction 1, it was explained.

The second major change in Direction 1 requires that multi-mill companies advise the Pulp Allocation Office of circumstances at any one mill that would make it impossible to complete either authorized deliveries of production of Direction 1 items in full, even after compliance with the direction. In such cases, WPB may require them to observe Direction 1 in whole or in part on a company-wide basis by adjusting their authorizations at other mills operated by the company.

Officials stressed the fact that this change in Direction 1 in no way relieves mills of any obligations under Paper and Paperboard Conservation Order M-241. Moreover, in its relation to Order M-93, this direction applies only in the event of a wood pulp deficiency. Otherwise, mills must observe fully their form WPB-2973 authorizations for each grade of paper and paperboard, they said.

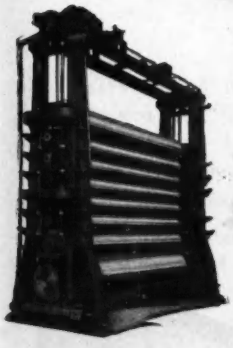
## April Newsprint Statistics

Production of newsprint in Canada during April 1945 amounted to 245,429 tons and shipments to 263,754 tons, according to the News Print Service Bureau. Production in the United States was 59,757 tons and shipments 58,942 tons. The output in Newfoundland was 27,739 tons and shipments were 17,492 tons making a total North American production of 332,925 tons and shipments of 340,188 tons. Total production in April 1944 was 310,714 tons and shipments were 336,723 tons.

The Canadian mills produced 42,524 tons more in the first four months of 1945 than in the first four months of 1944, which was an increase of 4.4%. The output in the United States was 13,056 tons or 5.7% more than in the first four months of 1944; in Newfoundland production was 26,372 tons or 32.5% more, making a total increase of 81,952 tons, or 6.4% more than in the first four months of 1944.

Stocks of news print paper at the end of April were 89,956 tons at Canadian mills, 6,133 tons at United States mills, and 65,638 tons at Newfoundland mills, making a combined total of 161,727 tons compared with 168,990 tons on March 31, 1945, and 164,847 tons at the end of April 1944.


# LOBDELL ... 109 Years in Business

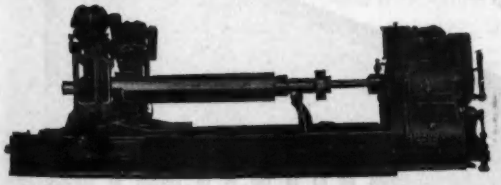


For more than a century the Lobdell Company has been a dependable source of supply for American industry. Iron founders and machinists, pioneering in the manufacture of chilled iron car wheels, the Company steadily enlarged its scope which today includes a modern line of machinery for the paper and allied industries.

**LOBDELL CALENDER STACKS** . . . accurate, dependable and easily operated. Roll lifts controlled from the floor, may be actuated by electric motor, hydraulic pressure or hand ratchet. Up-to-the-minute automatic lubrication . . . or anti-friction bearings . . . as service indicates.

**LOBDELL "PURALOY" ROLLS** . . . made of exclusive Lobdell developed alloys, having extra hardness and corrosion resistance to meet the added severe service of water finish or high pressure stacks.
Until recently under war time restrictions, the various metals employed in the services of "Puraloy" alloys are obtainable in sufficient abundance to enable us again to offer "Puraloy" rolls in quantities. Our engineers will recommend the alloy best suited for use with the particular chemicals you use in your mills . . . no obligation.

**LOBDELL ROLL GRINDER** . . . nearly fifty years ago, Lobdell patented the AUTOMATIC CROWNING DEVICE for their Roll Grinder. This was a big step forward in roll grinding — it enabled the grinding of a perfect crown of any size, on any length roll automatically.



With the new AUTOMATIC GRINDING WHEEL IN-FEED, all guess work is taken out of roll grinding. Instant adjustment is made for maximum cutting requirements. A half turn of a knurled knob gives continuous wheel pressure on the roll. This precision grinding saves time, reduces wear on wheels and eliminates the practice of too heavy or too light cutting. Regardless of the type paper to be made, the Lobdell Grinder will do a better, faster job. It occupies minimum floor space and lowers costs.

We are interested in your post war needs . . . and urge you to call upon us for information and consultation. Write for catalog.

**LOBDELL MICROMETER ROLL CALIPER** . . indispensable in keeping check on regrinding of rolls. Extremely accurate, light in weight and easily adjusted to varying roll diameter: 7" to 30", 8" to 36" and 9" to 42".

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WILMINGTON 99, DEL.
Established 1836

Built and sustained upon the rights to FREE, COMPETITIVE PRIVATE ENTERPRISE guaranteed by the Constitution of the United States

## BUYS SANGAMON PROPERTY

*(Continued from page 7)*

cal man in the paper industry; Dr. Louis Wise, who talked on cellulose and organic materials in the industry; and Miss Edith Strosschneider, librarian, who spoke on the uses for the library.

The new students also were scheduled to visit paper mills in the Fox River Valley before the start of regular classes. Paper chemistry classes ordinarily would begin in September but because of the accelerated program in most colleges, the group was ready earlier this year.

### Addresses Foremen on Veteran Employment

O. W. Price, chief of the vocational and rehabilitation and education program of the Veterans Administration at Wood, Wis., was the principal speaker at a meeting of the Foremen's Club of the Kimberly, Wis., mill of Kimberly-Clark Corporation.

He outlined a program for veterans' guidance and counseling within industrial plants, including survey and job classification, vocational aid, working condition surveys and study of the worker's capabilities in connection with the job to which he is assigned.

Tentative plans were discussed for a planning conference for Kimberly mill foremen.

### Northwest Superintendents Meet

About 76 paper mill superintendents of the Northwestern division of the American Pulp and Paper Mill Superintendents Association attended a meeting Friday, June 1, at the Conway Hotel, Appleton, Wis. Representatives were present from central Canada, Minnesota, Wisconsin and Illinois.

L. J. Smith of the Combined Locks Paper Company, Combined Locks, Wis., was in charge of arrangements. "Greater Use of Poplar" was the subject discussed by paper mill representatives and experts from the United States Forest Products Laboratory at Madison, Wis.

After registrations, opening at 8:30 in the morning, the first session began at 10 o'clock. A 12:15 luncheon was served at the Conway, and a banquet was held at 7:30 in the evening at North Shore Golf Club.

Fred Boyce, Milwaukee, a founder of the association and first president of the division, was one of the speakers at the dinner. Roy Nielson, Northwest Paper Company, Cloquet, Minn., was chairman of the division, and Charles Reese, Nekoosa-Edwards Paper Company, Nekoosa, Wis., was banquet toastmaster.

Women attending the meeting were entertained at bridge in the afternoon at the hotel.

### F. J. Sensenbrenner Heads Regents Board

F. J. Sensenbrenner, retired chairman of the board of Kimberly-Clark Corporation, Neenah, Wis., last week was elected chairman of the University of Wisconsin Board of Regents.

## Timken Elects Bergstrom Vice Pres.

At a board meeting held May 1, 1945 Albert L. Bergstrom was elected vice president of all engineering. Mr. Bergstrom, born in Sweden, graduated from Royal Technical Institute in Stockholm, Sweden, in Mechanical Engineering, came to this country in 1924, and became designing engineer for the Stearns Conveyor Company of Cleveland, Ohio. Mr. Bergstrom remained with Stearns until 1929 when he came with the Timken Company as development engineer. He was given various engineering and development assignments, later became chief works engineer, and in 1938 was made executive engineer.

# TENSION RIGHT... EFFICIENCY HIGH... MACHINES PRODUCING... ALWAYS

## WITH THIS F. L. A. T. DRIVE

You always *know* belt tension is right on a Flat Leather Automatic Tension drive. The pivoted motor base regulates tension automatically — high when the load is heavy, low when the load is light. There is no gradual, undetected slackening of the belt until it wears out from heat due to slippage!

Efficiency remains high above or below rated capacity (and most drives *do* run at less than rated capacity most of the time). A flat leather belt on a pivoted motor base drive operates at close to maximum efficiency from 50 to 150% of rated capacity at rated tension. Other short-center drives lose efficiency rapidly at loads either lighter or heavier than rated.

Production continues, uninterrupted, because the F.L.A.T. drive is never stopped for base adjustment.

Ask your Graton & Knight distributor for a demonstration.

Dependable, trouble-free service on a Flat Leather Automatic Tension drive is provided by "Research" Leather Belting, manufactured by processes which make it ideal for drives operating at higher speeds, over short centers and small pulleys.

Its greater pliability means it can withstand the constant flexing. Its "built-in" pulley grip means less tension required to deliver full power without slip. No idlers are necessary.

A "Research" Leather Belt on a F.L.A.T. drive will outlive a rubber V-belt on a corresponding drive by better than 2 to 1. Write Graton & Knight Company, 337 Franklin St., Worcester 4, Mass., for new, free Belting Manual.

GRATON AND KNIGHT

# Research Leather Belting

from Graton & Knight's line of leather belting—the most complete for all applications. Manufactured under one control from green hide to finished product. Branches and distributors everywhere. Look under "Graton & Knight" in "Belting" section of Classified Telephone Directory or THOMAS' REGISTER.

HISTORICAL HIGHLIGHTS OF PAPERMAKING NO. 14

# Papermaking in America is 3000 Years Old

The American paper industry is much more than a mere few hundred years old. Archeologists have recently discovered that the Mayans were making true paper approximately 3000 years ago.

Before the Mayans mysteriously disappeared, the Aztecs learned the secret of papermaking. This same process was handed down from generation to generation and today is used by the Otomi Indians of Mexico.

This is the method by which the first pulp paper was produced:

The inner bark of the fig tree is soaked in running water until the sap jells and can be scraped off. The fibrous residue is then boiled in lime, washed once more and laid on a flat wooden surface like a bread board where it is pounded to pulp. The pulp is left on the board and sun-dried.

The ancient Aztecs went one step beyond the 20th Century Otomis. Their process was identical up to this point. But after the paper was dry they sized it, then calendered it with hot stones to produce two surfaces readily adaptable for printing. (They printed with a crude kind of movable type.)

☆ ☆ ☆ ☆

As members of the paper industry, Cheney Bigelow has continued to serve United States papermakers with dandy rolls, cylinders, Fourdrinier Wires, and other mill supplies while engaging in important war production.

CHENEY BIGELOW

*Fourdrinier Wires • • Dandys • • Cylinders • • Wire Cloth*

CHENEY BIGELOW WIRE WORKS · 417 LIBERTY STREET · SPRINGFIELD, MASS.

## Scott Paper Co. Expands

Raymond C. Mateer, vice-president of Scott Paper Company announces that the company has acquired all the assets of Automatic Paper Machine Company, Inc., manufacturer of Cut-Rite wax paper and San Fay facial-type tissue. These assets also include paper-making equipment at Milford, N. J. and converting facilities at Hoboken, N. J. and Sandusky, Ohio.

R. H. Rausch, president of Automatic Paper Machinery Company is to become a vice-president of Scott Paper Company and a member of its board of directors. Mr. Rausch, who was a co-founder of the Cut-Rite business in 1924 and rapidly built it to top place in the household wax paper field, will continue to direct its operations as a division of Scott Paper Company.

Mr. Rausch is well-known throughout the paper industry and in merchandising circles and at one time was connected with the International Paper Company whose Marinette, Wis., Glens Falls, N. Y. and Fort Edward, N. Y. paper mills the Scott Paper Company purchased.

This acquisition will add the largest selling household wax paper and one of the most popular two-ply tissues to Scott Paper Company's already impressive line-up of consumer household products.

Cut-Rite, a quality product long established as the nationally advertised and distributed sales leader in packaged wax paper, now becomes a member of the distinguished tissue products family composed of Scott Tissue, Waldorf and Soft-Weve tissues; Scott Towels for Kitchen Use and Scotties facial tissues.

According to Francis W. Plowman, Scott Paper Company general sales manager, the R. B. Davis Sales Company will continue to handle the sales of Cut-Rite and San Fay until August 1, 1945, when Scott will take over complete distribution. Cut-Rite, and San Fay are distributed through the same wholesale channels and retail outlets as Scott Products.

## Tasmania Mill to Expand

Australian Newsprint Mills Proprietary Limited produced 26,700 tons of newsprint at its plant in Tasmania during the year ended June 30, 1944, says a report to the Department of Commerce, or approximately half of Australia's consumption under present rationing restrictions which permit the use of only 48,000 tons of newsprint a year. The company has just recently announced that it plans to increase the facilities at the Tasmania plant and will spend close to £A 4,000,000 (U. S. $12,800,000).

## FTC Issues Desist Orders

WASHINGTON, D. C., June 6, 1945 —Eight manufacturers of cylindrical liquid tight paper containers and the trade association of which they are or were members have been ordered by the Federal Trade Commission to cease and desist from participating in or continuing a combination and conspiracy to restrain trade and suppress price competition in the sale of their products. The order is directed against the following respondents:

Liquid Tight Paper Container Association, 1532 Lincoln - Liberty Building, Philadelphia, and its secretary and manager, George J. Lincoln, Jr.; Boothby Fibre Can Company, 84 Linden Park street, Boston; George T. Hynes, trading as Champion Container Company, Third and Somerset streets, Philadelphia; Fonda Container Company, Inc., St. Albans, Vt.; Menasha Products Company, Menasha, Wis.; Minkoff & Rosenfield Brothers, Inc., trading as Miro Container Company., 537 DeKalb avenue, Brooklyn; Russell Box Company, Kalamazoo, Mich.; Sealright Company, Inc., Fulton, N. Y., and Sutherland Paper Company, Kalamazoo, Mich.

Menasha Products Company, Russell Box Company and Boothby Fibre Can Company are no longer members of the association.

The commission finds that pursuant to agreement the respondent manufacturers, among other things, fixed and maintained uniform delivered prices, and adopted and maintained a zoning system whereby the United States was divided into certain zone areas, so that all purchasers within a given zone paid the same delivered price regardless of the distance of the purchaser from the manufacturer. As an incident to and a necessary result of the agreed practice of making only identical delivered prices, the respondent manufacturers, the Commission finds, have forced their nearby customers to pay more to the manufacturers for their products in order that more distant ones might pay less; have deprived nearby customers of any price advantage by reason of their proximity to the place of manufacture; and have thereby arbitrarily and systematically discriminated in price among their respective customers.

## B. C. Pushes Reforestation

Reforestation work has been pushed ahead steadily in British Columbia under the auspices of the Provincial Government. This work was really inaugurated on a major scale in 1933 when the Elk River Timber Company put one of its grading crews to work, under the supervision of F. S. McKinnon of the British Columbia Forest Service, on an experimental reforestation project. Today those trees are more than 20 feet high, and as thrifty and healthy as trees can be.

As a result of this and other experimental plantations, the B. C. Forest Service set about organizing for extensive planting operations. The capacity of the nursery at Green Timbers, near New Westminster, B. C., for the production of seedlings, was increased and prospective planting under this plan was done in 1938, and the trees grew rapidly. By 1939 the annual program called for 1,000,000 young seedlings a year to be planted on 1,000 acres of burned-over or logged-over land, which would not reproduce naturally. Each year these figures were increased until today the annual planting program calls for 10,000,000 trees, and the nursery facilities have been increased to the point where they can supply twice that number, which is the anticipated need in the post-war years. Up to date 36,000,000 seedlings have been planted.

". . . After more than three years of continuous operation, the 'pioneering' of these machines can truthfully be said to be practically complete . . . The Roberts Grinder produces more pulp of a given specification per square foot of floor area than other conventional types of grinders . . . Due to its continuous method of grinding, pulp quality is very easily controlled . . . There is an entire absence of shims, 'chop' also being reduced to a minimum . . . Since replacing pocket grinders with Roberts Grinders we have increased quality of our pulp considerably . . . Our experience with the Roberts Grinders shows that it is a large producer and sufficiently flexible to be used in manufacturing any type of groundwood pulp." Write for our new catalog giving complete information.

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PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger, Editor

## COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

Empire State Section. Technical Association of the Pulp and Paper Industry—Second Thursday of each month at the Woodruff Hotel, Watertown, N. Y.

Chicago Professional Paper Group. Third Monday of each month except July and August at Chicago Bar Association, Chicago, Ill.

## THE PAPER SUPPLY

With the end of the war in Europe it was generally expected that material improvement in the supply of paper for civilian use would very shortly occur. Although V-E Day marked the end of tremendous military activity in Europe, the problem of reestablishing order in Germany, the acute need of supplying food and other bare necessities in this and in other nearly destitute European countries, continues to divert enormous quantities of a large variety of materials and goods from civilian use. Lend-Lease, the Foreign Economic Administration and other government war agencies require heavy supplies of many kinds. In the repacking of supplies for Europe and civilian consumption, and for the Armed Forces in rerouting supplies for concentrated warfare in the Pacific, large tonnages of paper and paperboard are also required. Altogether, the all-over requirements must continue very large and home front supplies of paper and many other goods can only be gradually increased, with the prospect of little improvement in the immediate future.

The outlook for more paper and paperboard is dependent largely upon increased receipts of pulpwood by domestic mills. Receipts of wood have been maintained at a relatively high figure, considering the many handicaps, such as lack of manpower, bad weather in many areas, lack of an adequate supply of trucks which wear out very quickly in the heavy work of pulpwood transportation, and to lack of truck tires. Reflecting these obstacles total receipts of pulpwood at domestic pulp mills during April aggregated 1,199,600 cords, compared with 1,486,000 cords in March, and with 1,524,000 cords in March 1944. April, 1945 receipts are thus about 3% lower than in April, 1944. Total wood receipts for the first four months of 1945 decreased 5% under the period in 1944. April receipts of wood in the Northeast area increased 37% above April, 1944, but mills in this region require more spruce and fir. Inventories in the Northeast are 17% below April, 1944, which represents a critical situation in a decline of approximately 55% below the inventory level of April, 1944. Receipts in the Appalachian region in April were about 5% below last year, and about 13% above March, 1945. The situation is unfavorable and can only be met by increased production of pine, chestnut and other hardwoods. In the South, wood receipts in April were 12% above those of April, 1944, but 5% below March, 1945. This resulted in some decline in kraft paper and board output in mills west of the Mississippi River. In the Lake States area, April receipts totaling 70,200 cords were about 54% below April, 1944. Bad winter weather and early breakup in good logging weather created this unfavorable production. Mills in this area are reported to require the maximum production of balsam, spruce and hemlock during both the peeling and rough wood season of this year and through 1946. In the Pacific Northwest, wood receipts were about 21% below April, 1944. Bad winter logging weather followed by warm weather slowed down log production in April.

Increased production of pulpwood in Canada during the winter months, resulting from the favorable response of farm workers and others, has made it possible to increase shipments of newsprint to the United States in the third quarter of this year to 215,000 tons of 32-pound paper from the current rate of 200,000 tons. The Canadian Wartime Prices and Trade Board has stated that the paper and paperboard supply for Canadian consumption, while it has relaxed controls where possible, will reflect no immediate change, except in newsprint, from the current tight supply situation.

The one expected source of substantial relief in the acute paper supply is, of course, Swedish wood pulp. Time must elapse, however, for the clearing of mines in northern waters. Some improvement in the solution of the price and transportation problem has been lately reported. Swedish shipowners are now agreed to reduce their pulp transportation charges to the United States from the $12.50 per ton proposed by the War Shipping Board to $8 per ton. This increases the prospect of larger tonnages of pulp in direct shipments to U. S. ports. As previously stated in the Paper Trade Journal, the WSA rate of $12.50 per ton, with transshipment fee from the upper Baltic mills to Goteborg added, increased the total transportation cost $15 per ton, which importers have stated would be prohibitive, unless the OPA permitted higher than present ceiling prices, which is expected in some quarters to be the solution of this problem, and to expediting shipments to the U. S. at the earliest practicable date.

Informed sources state in reference to this situation that, if Swedish pulp producers and their agents here find it possible to ship pulp promptly and in substantial tonnages, it is probable that the pulp allocation for the third quarter, due about the middle of June, can be increased to provide some relief. Mill stocks of pulp are now very low, inventories of paper are very small, and relief will not be felt for several

months. Total inventories of wood pulp in March, 1945, had declined to 349,000 tons, a decrease of 8.9% from 1944. The greatest decline in inventories was in special grades, other than alpha and dissolving pulps, which decreased 40.8%; bleached sulphite stocks were 4.9% lower; unbleached sulphite, 32.8% lower; and groundwood, 28.2% lower. The inventory position in bleached sulphate increased about 55%; unbleached sulphate, 11.8%, and soda pulp increased 7.1% in 1945 above 1944.

## Establish Area Pulpwood Prices

WASHINGTON, D. C., June 6, 1945—Establishment of area dollar-and-cent ceiling prices for pulpwood in the western states is authorized by an order announced today by the Office of Price Administration, in Amendment 20 to RG Order No. 32.

Today's order delegates authority to OPA regional administrators to fix ceiling prices for pulpwood sales in areas within their jurisdiction west of the 100th meridian, which extends north and south across the country bisecting North Dakota. Regional directors may extend this authority to district directors.

It is expected that specific ceilings will be established as they are required in the various localities or areas. The order is effective May 30, 1945.

Ceiling prices of pulpwood in the western states have been at March 1942 "freeze" levels since September 1, 1944.

In certain areas, the pricing of pulpwood, which is used in the manufacture of wood pulp, and firewood, have been linked under local shortage pricing orders and determination of proper price relationship between them differs in the various local areas. Because of this and to enable OPA to obtain adequate data for establishing ceiling prices through conferences with local producers, maximum prices will be fixed on a local area basis.

## Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

| Current Weeks—1945 | | Corresponding Weeks—1944 | |
|---|---|---|---|
| April 21 | 90.7 | April 22 | 89.7 |
| April 28 | 88.0 | April 29 | 89.8 |
| May 5 | 90.7 | May 6 | 88.9 |
| May 12 | 85.4 | May 13 | 87.6 |
| May 19 | 92.5 | May 20 | 90.7 |
| May 26 | *92.0* | May 27 | 90.0 |

COMPARATIVE MONTHLY SUMMARIES

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1944 | 88.7 | 88.5 | 88.1 | 87.6 | 88.7 | 89.8 | 80.3 | 90.6 | 88.2 | 92.5 | 90.6 | 82.4 | 88.1 |
| 1945 | 86.7 | 89.4 | 90.2 | *88.1* | | | | | | | | | |

COMPARATIVE YEARLY SUMMARIES

| | 1938 | 1939 | 1940 | 1941 | 1942 | 1943 | 1944 | 1945 |
|---|---|---|---|---|---|---|---|---|
| Year to Date | 67.8 | 80.1 | 86.3 | 92.4 | 101.3 | 89.2 | 88.4 | *88.7* |
| Year Average | 71.5 | 83.4 | 85.6 | 97.4 | 90.4 | 87.8 | 88.1 | |

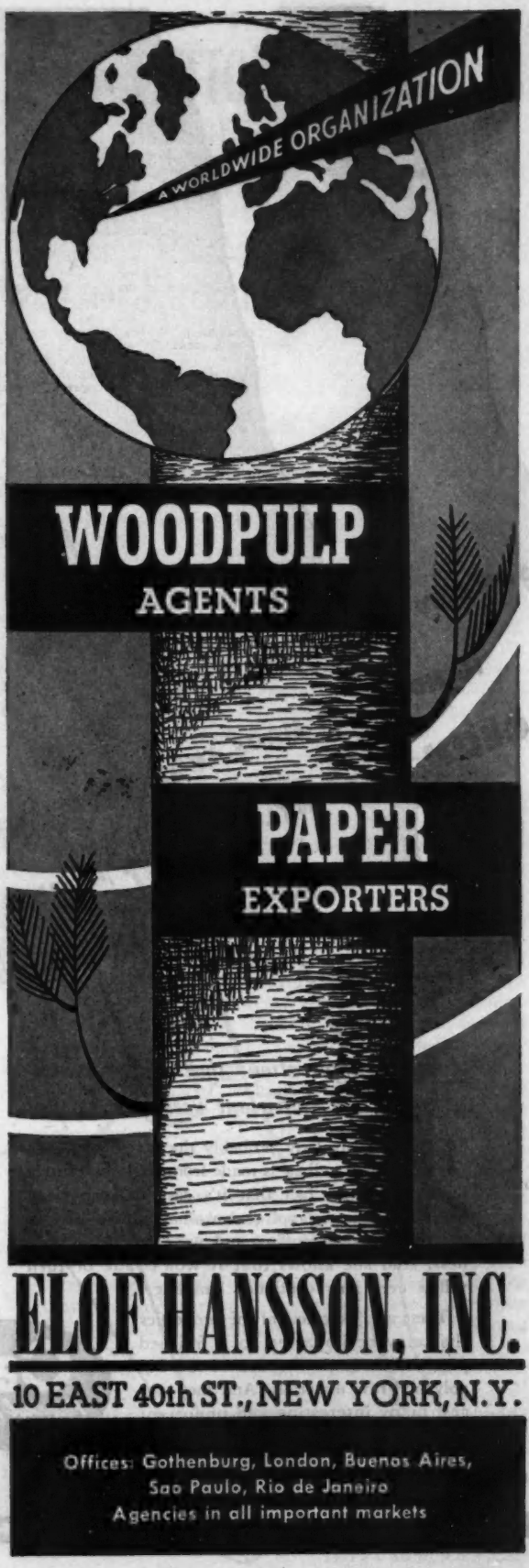
* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

| Current Weeks—1945 | | Corresponding Weeks—1944 | |
|---|---|---|---|
| April 21 | 98 | April 22 | 98 |
| April 28 | 99 | April 29 | 98 |
| May 5 | 97 | May 6 | 98 |
| May 12 | 94 | May 13 | 95 |
| May 19 | 97 | May 20 | 97 |
| May 26 | *97* | May 27 | 96 |

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Oct. | Nov. | Dec. | Year Avg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1944 | 90 | 96 | 95 | 96 | 96 | 96 | 85 | 96 | 92 | 95 | 95 | 85 | 93 |
| 1945 | 91 | 95 | 97 | *97* | | | | | | | | | |

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.



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Edited by R. G. Macdonald, Secretary

# Paper and Amino Plastics*

By Carl H. Pottenger[1]

**Abstract**

*The amino plastic resins, the urea-formaldehyde and melamine-formaldehyde types in particular, are discussed in relation to their use with paper in the manufacture of laminates and specialty papers.*

The industry to be discussed is based on the manufacture of amino plastic resins. These resins are essentially the reaction products of the condensation of formaldehyde with amino compounds, which reaction products are capable, under the action of heat or catalytic influence, or both, of increasing in molecular size to such an extent that they become infusible, resinous bodies. The principal representatives of this amino plastic field are urea-formaldehyde and melamine-formaldehyde resins, although this is by no means the complete scope of amino plastic materials. Commercially, however, these two types are by far the most important, and for this reason in this discussion the term *amino plastics* refers to urea or melamine formaldehyde resins.

It is believed that there are few who really appreciate the significance of the contribution which has been made by the paper industry toward the development of amino resin molding materials, and both amino and phenolic laminating procedures. The plastics industry is very grateful to the paper industry for these contributions, some of which will be referred to later on.

## Product Development

Prior to the war the plastics industry stood, in relation to the paper industry, predominantly in the role of a customer of the paper industry. Early in the development of thermosetting molding compounds, the first representatives of which were the phenolic compounds, it was recognized that cellulose was an excellent filler material lending strength, lower density, and improved molding characteristics to the phenolic compounds in which it was used.

Because of the dark color of phenolic resins, wood flour was adopted almost universally as the filler material for molding compounds. The amino resins (the urea-formaldehyde resins being the first of these to attain commercial importance) are, in contrast to their phenolic predecessors, water-white, light fast, thermosetting resins which open up to thermosetting molding a field for aesthetic exploitation, which is as great as the utilitarian field served by phenolic molding compositions.

Again, in the case of the amino resins, cellulose has been found to be a most satisfactory filler material. The incorporation of cellulosic filler lends to the molding compound not only lower density, greater moldability, and higher strength, but also serves to extend the urea or melamine resin with a less costly ingredient resulting in greater economy in the production of molded articles. The most important part played, however, by cellulosic filler in amino resin molding compositions is a dimensional stabilizing effect.

Clear amino resins, as they have heretofore been known, when molded, have shrunk, crazed, cracked, and deteriorated in relatively short periods of exposure to ordinary atmospheric conditions.

The growth of the amino resins from their low molecular moldable state to the high polymer, infusible state, in which they become usable as molded articles, is through a combination of condensation and polymerization. In the former of these two reactions types, water is eliminated from the reaction mass and is held as free water in the resin solid composition. If no filler is present to accept this water, the water segregates from the resin and causes the resin structure to shrink very severely. The presence of a cellulosic filler, however, which swells upon increase in moisture content, very effectively compensates the shrinking of the amino plastic resin to such an extent, in fact, that properly compounded cellulose filled amino plastic molding compounds exhibit excellent dimensional stability—both with respect to the difference between mold dimensions and finished piece dimensions, and with respect to dimensional changes over years of service at ordinary atmospheric conditions.

Unlike phenolics, it has been necessary to adopt a cellulosic filler for amino plastic molding compounds which will permit the widest possible application of color in delicate shades, so that the amino plastic materials may satisfy the most varied demands for colored molded articles. For this reason pure white alpha-cellulose has been generally adopted as the most satisfactory filler material for molding compositions for decorative and utilitarian applications where color is important.

In making available to the plastics industry a highly uniform grade of alpha-cellulose, through painstaking researches carried on cooperatively, the paper industry has made a very much appreciated contribution to the development of amino plastic molding materials.

* Presented at the meeting of the New England Section of the Technical Association of the Pulp and Paper Industry held in Boston, Mass., Dec. 15, 1944.

[1] Assist. Sales Manager, Plastics Division, American Cyanamid Co., New York, N. Y.

The amino plastic manufacturing industry incorporates into its molding compositions upward of 30% of the highest grade alpha-cellulose pulp. The consumption of alpha-cellulose in the production of alpha filled molding compositions is approximately 7,000 tons annually.

Since, prior to the war, the amino plastics industry was almost exclusively engaged in the production of this type of molding composition, they were and remain substantial customers of the paper industry.

### Use of Plastic Materials

The plastics industry's utilization of the products of the paper industry does not by any means confine itself to the use of alpha pulp in the production of molding powders.

The laminators combine a sheet-form paper filler with a synthetic resin by impregnation. From this impregnated sheet they assemble a number of relatively simple shapes and mold these under heat and pressure.

The molder buys his complete molding powder from his resin source. The laminator buys his resin from his resin supplier and his paper from the paper industry. The paper is passed through a resin solution and through driers, which remove the solvent and leave the paper impregnated with a resinous binder. The paper is usually rewound and later cut into the proper sheet form for the desired pressing operation.

The laminates are built up of several layers of impregnated paper to the desired prepressing thickness. The assembly is then subjected to curing in an hydraulic press under about 1000 p.s.i. at the proper platen temperature for the resin used. Kraft papers with phenolic resin impregnation are used for general structural laminates and for core stock with amino-resin impregnated fine-paper surface layers for most decorative work. All are familiar with the melamine-paper table tops which look like linen, or the beautiful pastel and figured laminates used for durable decorative paneling.

Those properties of amino resins and products of the paper industry, which complement each other so well, have opened up to the laminators a large field of decorative applications for their products. Accordingly, here again is found a marriage of resin and paper entering useful products which widen the markets for both paper and resin.

Laminating is, accordingly, merely molding using a laminar filler. Because of the laminar filler, the moldability of the material is limited to relatively simple shapes—flat sheets, rods, tubes, and simple curved sections within the drawability of the paper used. Amino plastic laminates do not vary appreciably in chemical composition from amino plastic moldings, but they are much stronger than the latter because of the fact that the strength of the sheet-form filler is preserved in laminates, whereas the integrity of the filler is destroyed in the process of making molding powders.

#### War Developments

The foregoing are examples of established and, beyond doubt, lasting applications of paper in connection with plastics. The war has mothered the application of plastics and paper along lines not heretofore considered. Largely because of the necessity of producing light structures of great strength for aircraft and airborne equipment, there has been a very considerable development along the line of production of complex shapes in paper-base laminates. Because of the difficulty of applying high pressure to irregular shapes, and because of the prohibitive cost of such high pressure toolage, new low-pressure laminating resins have been developed, which bond satisfactorily at pressures in excess of a minimum of 50 p.s.i. Amino resins, urea, thiourea, and melamine, as well as phenolics and resorcinol resins, have been adapted to this technique.

Dropable gas tanks, wing tips, instrument housings, aircraft seating, fairings, and even complete monocoque fusilages for light aircraft have been built of resin-paper combination in this manner.

Admittedly, some of these materials, developed to meet military necessity, are too expensive for general peacetime utilization. The fabrication techniques, and the waste involved, are in many cases far too costly for other than unusual circumstances. In many cases these materials and their fabrication processes have been adopted because of shortage of a more suitable metallic medium. The fact remains, however, that these materials (paper and resin) have been established in the minds of design people as materials for structural utilization, as well as for uses that appeal merely to the aesthetic.

A number of types of combined utilization of paper and resin have been covered as they are used to produce most unpaperlike products. Now to examine the role of amino-resin in the field of papermaking and paper conversion, in which the end products are readily recognized as paper.

In these fields the amino resins find application as coatings, adhesives, or as modifying agents to impart to cheaper or more suitably operating adhesives or coating compositions those properties of synthetic resins which may be desired in the final product.

#### Resins for Paper

One of the most important contributions which the resin-producing industries have made to paper manufacture has been the development of techniques for the production of papers of extreme wet strength. These new amino plastic, wet strength papers, like many of the applications of amino resin and paper discussed above, have had no particular background of peacetime experience. However, in this case, it is almost certain that the improvement effected by the use of these agents is definitely of such extent that it will justify the small additional cost of production for many peacetime applications.

Through the use of amino-resins in conjunction with starch adhesives the products of factories and packing houses have been carried to the fighting fronts in boxes which remain boxes, even after long exposure to the weather or surf. The V box, with its many admitted shortcomings, is still a great factor in the war's prosecution and it is gratifying to know that it was developed through the cooperation of the paper industry and the plastics industry, aided in a most important manner by the starch industry.

The urgency of adaptation of the starch-resin adhesive has not permitted full study of the chemical nature of the system. Its study has only now begun. From a more thorough knowledge of its nature it may be possible to effect great improvements in the adhesive compositions, as well as important reductions in the cost of their application. Already, new paper coating techniques have developed from this basic formula.

Combinations of amino resin with other resin bodies show promise as both heat and pressure sensitive adhesives.

### Post-War Possibilities

The post-war possibilities of this type of waterproof gluing are developments on which our two industries must continue to work together. The application of a water resistant gluing technique will go a long way towards opening up to the paper containers, fields, which they have heretofore not been able to serve, because of severe moisture conditions encountered in service. The mere improvement of the quality of bond attained by the use of resin-modified adhesives will not, however, suffice to make a perfectly acceptable container for refrigerated shipments and other severe moisture exposure utilization. A great improvement in paper, from the standpoint of its rigidity when wet, is needed to place fiber containers in a favorable competitive position, as compared to wooden or wire-bound wooden containers now used for refrigeration shipments.

Particularly, the development of a corrugating member which remains stiff when wet is of great interest to the container industry. This is a task for the paper technologists, and for the resin interests, which must be undertaken and solved before real benefits can be realized from the newly developed gluing methods.

Some applications of amino plastics and paper, which have not yet reached important commercial volumes, show promise of creating almost unbelievable markets for the products of both industries.

The plywood industry is badly in need of a suitable resin impregnated paper to surface its product. It is desired to obtain in this way a sealing effect, provide a decorative surface, or an improved base for surfacing by coating. Not only is it desired to improve present grades of plywood, but also to permit the use of inferior face veneers. In this connection, it might be well to mention the fact that the extreme utilization of wood in plywood for aircraft and marine uses has seriously depleted the resources in the best grade of veneer peeling logs, with the result that the quality of veneers which will be available for some time to come will be definitely inferior to those which have been used in the last few years. All indications are that this application of resin and paper will require very large quantities of products of both industries.

Many of these uses of paper and resin have had no counterpart in the peacetime economy. Many of them may die upon the cessation of hostilities. Wherever their use has been of the nature of an "ersatz" for a temporarily unavailable medium of greater merit for the purpose, it is expected that they will yield to the more suitable material a position which they may have well served. Where the technique of fabrication has been justifiable only as an expedient in the great emergency—their future is certainly equally dismal. Where, however, there has been sound engineering merit in the resin-paper composition, where economically rentable techniques of production have been learned and taught the markets will have been expanded permanently.

There is the repeated question, "Will plastics compete with paper in the future?"

There is certainly a great field for the use of plastics for durable and semidurable goods. Plastics have in the past enjoyed a good market in the expensive container field. Of course, plastic products will vie with paper products for some markets. Considering the important paper content of amino plastic molding materials, and laminates, any increase in the use of these plastics will remain an increased outlet for the product of the paper industry. The author is certain, moreover, that the many ways in which the paper industry and the plastics industry supplement one another far outweigh the few cases of competition.

An attempt has been made to point out the many ways in which the paper industry has contributed to the development of the plastics industry, and to indicate that the resin manufacturers, in turn, have made some contribution to the improvement of the products of the paper industry.

Nature has set an excellent example for the compatibility of cellulose and resins in the composition of wood. Wood is essentially cellulose, and cellulosic derivatives, bonded together with natural resins. It, therefore, seems most logical that the application of some synthetics to bond the stronger cellulosic members of wood can lead to very much improved materials of construction.

There is a common job in the future, since the interests of the two industries run closely parallel. The assistance of the paper industry is needed in solving the problems of the plastics industry. The plastics industry desires to study with the paper industry, their problems involving the use of plastic materials in the making and utilization of paper. The cooperative effort which had its beginning in the cooperation of the paper industry to develop new molding compounds, has expanded very considerably during these war years, and is only the beginning of ever closer collaboration between the paper industry and the chemical industry.

They can hardly be viewed as competitors in consideration of the many ways in which their products come together in use.

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## New TAPPI Members

Edward F. Arnold, assistant manager, Technical Service Division, Commercial Solvents Corporation, 17 East 42nd street, New York 7, N. Y., a 1924 graduate of Syracuse University.

Lester F. Borchardt, head, Physics and Physical Chemistry Section, General Mills, Inc., 2010 E. Hennepin avenue, Minneapolis, Minn., a 1929 graduate of the University of Minnesota.

Stanley A. Clarke, chief, Division of Forest Products, Council for Scientific and Industrial Research, 69 Yarra Bank Road, South Melbourne, Australia, a 1924 graduate of the University of Western Australia.

Bruce W. Ellis, chief engineer, Buffalo Pumps, Inc., 874 Oliver street, North Tonawanda, N. Y., a 1932 graduate of Rensselaer Polytechnic Institute.

William C. Ferguson, sales engineer, John W. Bolton & Sons, Inc., 9 Osgood street, Lawrence, Mass.

James W. Hemphill, staff manager, Pulp and Paper Industry, Johns Manville Sales Corporation, 22 East 40th street, New York 16, N. Y., a 1914 graduate of the University of Pittsburgh.

Robert W. McAloan, laboratory director, Union Mills Paper Manufacturing Company, New Hope, Pa., a 1939 graduate of Indiana Technical College.

James W. Purdey, bleach plant operator, British Columbia Pulp and Paper Company Ltd., Port Alice, B. C., Canada, a 1941 graduate of the University of British Columbia.

Richard A. Wolterding, product engineer, Kimberly-Clark Corporation, Neenah, Wis., a 1935 graduate of Northwestern Uniyersity.

# Care and Maintenance of Supercalender Rolls*

By George A. Thompson, Jr.[1]

**Abstract**

*Paper is coated to improve its printing qualities and must be supered if a good finish is to be obtained. It is important that proper procedure be followed in installing, breaking-in, and maintaining the supercalender rolls if satisfactory results are to be obtained. Recommendations are given.*

The mills in the East are probably more informed on the so-called conversion or brush-type coated papers as compared to the varied machine coated papers. A brief resume on today's machine coated papers is in order.

First, all are agreed that any coated sheet is superior in appearance and printability to an uncoated sheet. The first departure from a plain sheet to achieve better printability was the clay filled sheets to be followed by carbonates and various type fillers. These papers, usually supercalendered, did not meet the continued demands made by the printer on the paper manufacturer for a lower priced sheet. As press speed became higher, new inks were developed to meet these increased speeds. Consumer demand for multicolor printing and photographic reproductions made continued improvement necessary. Machine coated papers are the answer to these demands.

Today, tons of machine coated papers are produced daily by as many firms as there are methods of producing these papers. In principle they achieve similar results, but one and all are continually seeking to better their product with an eye to eventually duplicating a sheet similar to the conversion or brush type coated papers. Whether or not such accomplishment will materialize is a debatable question. The fact remains, however, they have progressed tremendously and will continue their efforts to do so. One thing is certain—it will make the consumer coated-paper conscious through lack of eye strain and through a better appreciation of multicolored printing.

The conversion type coated paper manufacturers should discontinue their inherent prejudice against groundwood papers. Of all the fibers entering into the making of paper, groundwood papers have progressed most, especially the groundwood machine coated papers. Although starch coated, which does an excellent printing job but does not lend itself to offset printing, they have come from 1 to 5 pound per side per ream to 6 and 8 pounds per side per ream, and at Chicago this year mention was made of applying 12 pounds per side per ream.

It is known that as the weight of coating increases, printing qualities and appearance increase in like ratio. What tomorrow will bring forth, the author for one would not hazard a guess. When the post-war surge comes, it will come from the bottom upward. This upward surge will continue gathering momentum throughout the industry. Every mill in its path, every grade produced, from the 100% rag content downward, will feel this effect.

Post-war plans should include the scrapping of out-moded machinery and the installation of new machinery to offset any encroachment. Large tonnage production is sought by all mills. With machine coated papers it becomes a *must*.

It can be asked what has all this to do with supercalendering. Only this—all coated papers need be supercalendered to secure the necessary finish and make secure the necessary bond.

Coated papers of the conversion type are supercalendered best on cotton rolls. Some machine coated papers are supercalendered on cotton rolls. As progress is made on this type of paper, more will turn to cotton for cotton imparts to the finish characteristics no other type of roll can duplicate.

## Care Before Installing

When a roll is received at the shop for refilling, care is taken to obtain its exact measurements. Its surface condition is examined and notation made of any and all injuries.

With the changes that have taken place in the paper industry today, it is necessary to know and recognize them. Probably a roll made a few years ago will not suit the application today. The making new or refilling of a roll is not haphazard guess-work. Much time is consumed in preparing the filling long before the roll is ready for filling. The filling is then started under expert supervision to assure return delivery of the proper density and resiliency. When a roll is finally shipped it has been turned on its centers and ground on its journals until the finished roll across its entire face and overall dimensions is true to within 0.001 inch.

Rolls received from the manufacturer should not be held in storage any appreciable length of time. If they must be stored any appreciable length of time, they should be rotated on their axis 180° often enough to assure their being true when wanted. Even after all these precautions, if some time elapses while in storage, or if the roll is of wide face and has travelled a long distance with the jolts incidental to such a long journey, the roll should be placed in the grinder, set up, and indicated. If found out of true, a light cut should be taken across the face before being placed in the stack.

When placed in the stack for the first time, its direction of rotation should be noted and the roll so marked to assure its being rotated throughout its life in the same direction. This rotation is also carried through when the roll is removed for turning in the lathe and grinding after being pulled for reconditioning.

## Checking

Roll checking is the bane of all supercalender men for the checks point to early removal from service. The harder a roll, the worse the checking is when checking develops. The danger in making a roll

* Presented at the meeting of the New England Section of the Technical Association of the Pulp and Paper Industry held in Holyoke, Mass., Nov. 17, 1944.

[1] Member TAPPI; Paper Mill Rep., B. F. Perkins & Sons, Inc., Holyoke, Mass.

softer to avoid checking is the constant threat the roll may go to pieces under heavy nip pressure. For any constant nip pressure, the nearer the roll hardness is to the ideal for that nip pressure the less tendency there will be to check.

Regardless of the density required on any cotton roll application a roll without resiliency is useless for all practical purposes. As speed and pressure increase, the temperature in the roll rises. The roll under this increase in temperature tends to soften. This explains in part why the density of a roll should be made for the highest pressure and temperature that has to be encountered and also explains why a roll thus made will not finish or cover as well when used below the maximum required.

Rolls check more frequently on stacks having high nip pressures on plain bearing stacks, when too dry papers are processed, and also in mills that skimp on conditioning the roll surface. In this respect it might be said that check marks have been about 90% eliminated by the installation of antifriction bearings. Checks are a breakdown of the cotton fibers under repeated bending. The sharper the nip, the shorter is the bend in the cotton fiber, thereby concentrating the pressure on a smaller area. The nip varies with the circumference of the intermediate chilled iron rolls, therefore, rolls should preferably be broken in in the top position to take advantage of the lesser weight and broader nip of the top roll or in the bottom position to take advantage of the much broader nip in the bottom roll.

### Breaking in Rolls

Rolls should be installed with their protective paper wrapping to preclude any oil or grease coming in contact with them.

As is well known, all rolls in the stack except the bottom roll, revolve by friction. The drive being on the bottom roll, all rolls above are really gears with invisible teeth. This places a terrific strain on a green roll unless precautions are taken to fuse a crust on the immediate outer surface to withstand the friction necessary to drive the roll above it. However smooth a roll is ground, a strong glass discloses many porous irregularities in the surface that must be sealed to assure satisfactory surface and long life. To achieve this result the roll should be rotated slowly with a minimum of steady pressure applied preferably through the turnbuckle rather than the weight levers, and water applied sparingly. Please note well that word "sparingly." The roll at the start is very absorbent and a glazed appearance should manifest itself before allowing water to become visible in the nip. As the temperature increases, enough water should be added at stated intervals to insure their not being unduly overheated too quickly.

At this point trained observation, based on past experience, is of the utmost value, for at this stage the life of the roll can be materially shortened as well as its probable premature removal from service for reconditioning if the process is unduly hastened. The roll while in the process of breaking in should never become uncomfortably hot to the bare hand until such time as the roll is thoroughly broken in and allowed to assume its normal running temperature.

During this period, varying with the conditions encountered, pressure has been increased very gradually and the roll sponged more often as the temperature increased until such time, based on experience, the operator feels the roll is ready for service. The roll has by this time absorbed much water. Allow the roll to run until it is perfectly dry and then follow through by observing these few don'ts:

Don't overwork your stack by running too dry a sheet.

Don't wash down a hot stack with cold water.

Don't ever jog or inch a stack with pressure on.

Don't allow too much surging of weight levers.

Don't abruptly shut down a hot stack.

The drier the paper being run means working the cotton rolls that much harder. The crust on the roll chars and the checking starts immediately beneath. When a cotton roll is removed from service and refinished only by grinding to true up the surface, it comes back into service with incipient checks already in the surface. In order to eliminate this hazard the roll should be turned in the lathe, the entire crust removed and a final slow, fine feed taken across its entire surface. The fiber coming from the roll at this point should be closely observed and any breaks or kinks should be studied with a view to the possibility of a further cut being made if necessary. When once a white, unbroken thread is coming from the cutting tool, all traces of checking have been removed. The importance of this cannot be too highly emphasized.

The time consumed in properly breaking in a roll is an investment. By fusing a proper crust on the immediate outer circumference one is insured of setting up a good barrier against check marks. A roll properly broken in before paper is allowed to run through the nip will never check unless too scant attention has been paid to the proper moisture content in the sheet or to a poorly calipered sheet that requires the touching up of the rolls by the operator thereby uncovering the spot touched up to the ravages of heat and also taking away the crust at this spot.

### Sanding of Rolls

It was mentioned earlier how the rolls were ground to a tolerance of 0.001 inch. Assuming for the moment the chilled iron rolls are ground to the same tolerance, and they should be, then why upset perfection by sanding the rolls to fit the sheet? There is not one who can sand a roll or any fractional part of a roll and maintain a uniform caliper of that roll either across its face or circumferentially.

If shutting down production to sand all rolls is looked upon as necessary—and it is necessary once sanding is accepted as standard practice—then all rolls should be withdrawn from service and properly reconditioned. When placed back in the stack proceed just as cautiously as in the breaking in a new roll. At best, sanding should be only employed as an emergency measure and to keep the ends of the filling outside the path of the paper from becoming high.

Supercalendering will not hide any faults in the sheet. It will bring out the faults forcibly and when this fact is more generally understood and proper steps taken to provide a sheet of uniform caliper, of proper formation and with the correct proportion of moisture content, more satisfactory results will most certainly be obtained.

In conclusion, attention should be given to coating papers of wider face. Increased speeds of coaters merit plenty of study also. Existing supercalenders should be equipped with the latest devices pertaining to pressure, tension, and temperature, and the installation of antifriction bearings on all rolls. Attention is also directed to substantially increasing roll diameters to offset any decrease in roll life.

# The United States Department of Agriculture's Western Regional Research Laboratory*

By W. B. Van Arsdel[1]

**Abstract**

*The Regional Laboratories were created by an Act of Congress in 1938 to conduct research and development work for the purpose of extending the markets for farm commodities. Laboratories were established in the Eastern, Western, Northern, and Southern regions of the United States which, in general, specialize on the particular interests of the region involved. The constitution and activities are described with particular reference to work of the Western laboratory.*

Some of the member of TAPPI have visited the Western Regional Research Laboratory, and a number have maintained contact with certain phases of the work which are related to technical problems of the pulp and paper industry. It is believed, however, that many are unfamiliar with the purpose of the Regional Laboratories, and would be interested in a general description of their activities.

## Genesis of the Regional Laboratories

The idea which culminated in 1938 with the Act of Congress establishing the Regional Laboratories had been developing over a space of many years. Roughly, the idea was this: The American farmer needs a diversification of the market for his produce. Like a one-industry town, or a mill under contract to a single customer, he has been vulnerable. Not only that, but a whole great group of farmers was experiencing a disastrous shrinkage of markets, caused in part to the rise of competitive nonfarm products. Perhaps a vigorous research program in the farmers' behalf could uncover new uses leading to a broader and more diversified market for his product. At least, it was thought, let us see what science and technology can do if they are applied to this problem as they were applied long ago to the production of improved crops.

One aspect of this idea came to be known as "chemurgy." The National Farm Chemurgic Council sponsored annual conferences which stimulated widespread interest in the discovery and development of new uses for farm products. Interest was especially keen in the Pacific Northwest. Dr. H. K. Benson, of the University of Washington, was one of the leaders in the movement. In all of this discussion the idea of *new* uses was central. Since most farm products are grown for food, the chemurgic idea typically emphasized nonfood products — plastics, fibers, industrial chemicals, and the like—made from farm wastes and such crops as corn, wheat, and soybeans. The department established research laboratories at Arlington, Virginia; Ames, Iowa; and Urbana, Illinois, primarily for the purpose of investigating these possibilities.

The almost unmanageable surpluses of important farm crops during the depression years led to several proposals for increased governmental research on the utilization of these crops. A bill calling for the establishment of a cotton utilization research laboratory in the South was broadened to provide for four laboratories, one in each of the four great regions of the United States. This authorization directed that the Secretary of Agriculture was to: " . . . conduct researches into and develop new scientific, chemical, and technical uses and new extended markets and outlets for farm commodities and products and byproducts thereof. Such research and development shall be devoted primarily to those farm commodities in which there are regular or seasonal surpluses, and their products and byproducts."

This charter is evidently broader than the idea expressed by the word "chemurgy." The central theme is a broadening and diversification of the fields of utilization of farm products. Research on utilization as food is specifically included within the program.

The relation of the Regional Laboratories to the Forest Products Laboratory at Madison, Wisconsin, should now be apparent. Both the Forest Products Laboratory and the four Regional Laboratories are concerned with the utilization research, but the one handles products of the forest while the others handle products of the farm. In the nature of things, the interests of the pulp and paper industry are much more directly connected with the Forest Products Laboratory than with the Regional Laboratories. The pulp and paper industry has been fortunate in having the resources of that splendid institution available to it for more than three decades. The Regional Laboratories are in no sense rivals or supplanters of the Forest Products Laboratory. Their points of contact with the forest industries, while numerous, will always be supplementary and complementary.

## The Four Regional Laboratories

The four laboratories established in accordance with the Act of 1938 are located in Peoria, Illinois; near Philadelphia, Pennsylvania; in New Orleans, Louisiana; and in Albany, California, across the Bay from San Francisco. Generous physical resources have been provided. Each of the laboratories is valued at more than 2 million dollars and is designed to accommodate a staff of about 250 people with facilities both for chemical, physical, and biological laboratory research and for engineering and pilot plant development. Very fortunately, the buildings were completely and basically equipped before the outbreak of the war—almost in the very nick of time to be ready for the highly important role they have played in war research.

* Presented at the meeting of the Pacific Section of the Technical Association of the Pulp and Paper Industry held at Camas, Wash., Nov. 14, 1944.

[1] Head, Engineering and Development Division, Western Regional Research Lab., Bureau of Agricultural and Industrial Chemistry, Agricultural Research Adm., U. S. Dept. of Agriculture, Albany, Cal.

The primary division of responsibility between the four laboratories was based upon obvious differences in the farming interests of the four regions. The New Orleans laboratory naturally emphasizes research on the utilization of the cereal grains. The Philadelphia and Albany laboratories have no such simple bases of reference because of the great diversity of agricultural interests in the eastern and western regions. The Western laboratory does, however, devote a large part of its funds to research in fruit, vegetable, and poultry products utilization.

Each of the four laboratories is also somewhat distinctive from the standpoint of chemical specialization. The Northern laboratory specializes in the chemistry of cellulose, lignin, and hemicellulose as related to the utilization of agricultural residue. The Southern laboratory maintains a strong research program on the vegetable oils, typified by cottonseed and peanut oils. Intensive work on protein chemistry is carried out both in the Western and in the Eastern laboratories. The fundamental chemistry of the hemicelluloses is studied in the Western laboratory. These divisions represent, of course, only special emphasis, not monopoly of fields of work. One specialty that holds intense interest for pulp chemists, namely lignin chemistry, is being studied at the Northern laboratory both from the theoretical and practical viewpoints, but only as applied to the annual plants.

What might be called specialties in technology are also developing in the four laboratories. The Southern laboratory is headquarters for the technologies of textiles and oilseed crushing. The Eastern laboratory has emphasized the technologies of organic synthesis and tanning. The milling of cereal grains, industrial fermentations, and certain types of pulping operation and board formation, are specialties at the Northern laboratory. The Western laboratory has strong interests in food processing technologies, especially freezing and dehydration.

### The Western Laboratory

In view of the fact, already stated, that the major fraction of the Western laboratory's resources goes into research on the utilization of fruits, vegetables, and poultry products, the emphasis on food technology is inevitable. The composition of these farm products and their economic position as relatively high-priced foods practically confine the "chemurgic" possibilities to the utilization of byproducts. In particular, the major component of all of them in the fresh condition is water. The simplest calculation will demonstrate that they cannot be considered as economic industrial sources of their main dry constituents—sugars, starch, proteins, and fats, e.g., the recent wholesale values of some of these products, as shown in the accompanying table, run up to well over a dollar per pound of dry weight.

| Commodity | Moisture Content % | Price per Pound Dry Solids Cents |
|---|---|---|
| Potatoes | 78 | 7.5 |
| Peas, unshelled | 74 | 14 |
| Peaches | 83 | 18 |
| Grapes | 78 | 18 |
| Tomatoes | 94 | 23 |
| Carrots | 88 | 27 |
| Apples | 84 | 31 |
| Lettuce | 95 | 69 |
| Asparagus | 93 | 108 |
| Eggs | 74 | 126 |

The dry-weight values of other farm products which are normally low in moisture content present a striking contrast to these figures, as shown in the following table:

| Commodity | Price per Pound Dry Solids Cents |
|---|---|
| Residues (Straw, stalks, etc.) | 0.4-0.6 |
| Alfalfa hay | 1.3 |
| Corn | 2.2 |
| Wheat | 2.4 |
| Soybeans | 3.0 |

The applied phases of research in the Western laboratory therefore divide generally into two groups —research in food processing, and research on the recovery of byproducts from processing wastes. Note that the foregoing statement does not say that all of the research activities of the laboratory can be so divided; research on the chemistry of enzymes and other proteins, for example, is pursued simply in order to attain a deeper and broader understanding of that complex subject, and in the confidence that the knowledge will be needed both in the food research and in the byproducts research.

### Food Processing Research

Fruits, vegetables, poultry, and eggs play an important part in the agricultural economy of the Far West. Their combined annual farm value in the eleven Western States has exceeded 700 million dollars in recent years. A very large proportion of each of these commodities is processed in some manner, simple or complex, before it reaches the consumer. Peaches are canned; grapes are crushed for juice or wine, or are dried for raisins; tomatoes are canned or their juice is bottled; peas are frozen or canned; potatoes are dehydrated; poultry is dressed, and much of it is frozen. Even the foods which go to market in the fresh condition undergo more or less complex processing, such as washing, trimming, culling, packaging, and chilling or holding in cold storage. These processing operations are typically carried on as commercial or cooperative enterprises, and at centralized points—canneries, freezing plants, dehydration plants, packing plants, and the like. The additional labor expended on the farm products in such plants, together with packaging and other manufacturing costs, adds materially to their value, e.g., the factory cost of canned, frozen, or dehydrated vegetables is commonly from two to four times the cost of the raw material delivered to the factory. The size and value of the farmer's market for his produce may therefore be deeply affected by what happens in the processing plant—and not by any means from the cost standpoint alone. Even more fundamentally, that market will be made or broken by the food quality of the processed goods. The farmer has a tremendous stake in the attainment of top-notch performance in these plants, and in basing that performance on the best knowledge that modern science and technology can offer.

The Western laboratory has concentrated its food research work on two of the more important technologies—freezing and dehydration. The research on freezing preservation is an outgrowth of work that was started a number of years ago at a department laboratory in Seattle. Out of this field of research have come many of the techniques that have made frozen-packed foods welcome and familiar in millions of American households. About thirty persons are engaged in work on this program in the Western laboratory. In our opinion, the technology of food freezing is still in its early childhood, if not in its infancy. Problems of raw material selection and

handling, prefreezing treatments, sanitation, packaging, and plant design and organization, are as important as they are troublesome. A wide field of development of new frozen foods remains to be explored. The basic physics, chemistry, and engineering underlying the industry are only imperfectly understood.

Research on food dehydration came to the Western laboratory as an urgent national defense project six months before Pearl Harbor. During the intervening three and one-half years, it has occupied a major share of attention. Emphasis was placed on dehydrated vegetables and spray-dried whole eggs since both of these kinds of concentrated food were needed in huge quantities for our armed forces and allies and the necessary technologies were almost undeveloped.

Perhaps it is not generally appreciated how large this emergency industry now is. The scheduled production of dehydrated vegetables for government account during the current year is approximately 190 million pounds, and that of spray-dried whole egg approximately 300 million pounds. These amounts correspond to a total value of more than 400 million dollars. And yet the commercial production was negligible in 1940. Some 135 vegetable dehydration plants have been built, technologists have been trained, procedures have been worked out, discarded, improved, and improved again.

The research workers at the Western laboratory have been in the thick of the struggle to accomplish that much, but they know, better than anyone else, how much remains to be done. Dehydrated foods are, in general, very good as freshly manufactured, but they are not imperishable, as so many people appear to assume. Under tropical conditions especially, their useful life is short. The problem is serious, but it is believed we have our fingers on the means for its solution. We believe, too, that if this emergency problem is solved a solid foundation will have been laid for the development of a peacetime food dehydration industry that can take an important place alongside canning and freezing as a normal means of processing certain foods.

Two important Western farm products, namely wheat and alfalfa, occupy a rather special place in the research program. The work was originally conceived in terms of the chemurgic idea alone. Work on the major constituent of wheat, the starch, wheat protein and alfalfa constituents have been made, no perceptible broadening of the market for wheat or alfalfa can realistically be expected to flow from them. A really significant approach would have to emphasize the food or feed uses of these commodities.

### Byproducts Research

The industrial processing that most Western farm products undergo opens up numerous possibilities for economic byproduct utilization. Many of the processing operations are accompanied by heavy culling, trimming, peeling, or leaching losses. Such wastes as brandy still slops, asparagus butts, and washings from potato dehydration plants may be as much of a nuisance to the operators as sulphite waste liquor sometimes is to a pulp mill.

The Western laboratory has been pursuing several lines of byproduct development. One of the especially interesting fields has come from discoveries in protein chemistry that have already led to new types of artificial fiber. While it is too early to estimate the value of this discovery, the potentialities are very great. Nature utilizes proteins freely in a thousand clever and successful constructions. The chemist may one day be able to match or better some of those natural achievements.

Other byproduct developments in which the Western laboratory has been interested include the recovery of tartrate from winery wastes, the preparation of a concentrated asparagus butt juice that is an excellent culture medium for the propagation of certain industrially important microorganisms, and the growing of high-protein, vitamin-rich feed yeasts on fruit cannery wastes. All three of these processes have been investigated on a semicommercial scale in cooperation with processing plants. Still other byproduct processes are still undergoing investigation in the laboratory.

One special byproduct study in the Western laboratory that holds a particular interest for the pulp mills of the Northwest concerns the extraction of a tanning material from Western hemlock bark. Many are familiar with this work. Since hemlock bark is not a farm product in any ordinary sense, its study in the Western laboratory may be a bit puzzling. The reason is historical. The bureau has for many years conducted an active research program on the technology of tanning and tanning materials. A number of years ago two of the bureau's investigators turned their attention to Western hemlock back as a potential native source of tannin. Their work showed there were real possibilities, but also real difficulties, both technical and economic. The investigation had to be concluded before the matter could be explored fully. When the Regional Laboratories were established, this line of work on tanning was set up in the Eastern laboratory. Shortly after, the war made the threatened shortage of tanning materials an actuality, and further investigation of Western hemlock — along with other domestic sources of tannin — became urgent. With the full consent and cooperation of the Forest Service, laboratory work on some of the pressing technical problems was started in the Western laboratory, close to the mill operations that would be sources of the bark. Practical tanning tests have been conducted in the Eastern laboratory. Although the investigation is still under way, particularly in one of the Northwestern pulp mills, it is not too early to say that real progress has been made toward a solution of the problem.

### Engineering Research

The emphasis on industrial processes in the Regional Laboratory program led naturally to the organization of engineering research divisions in each of the laboratories.

In the Western laboratory the engineering staff has been concerned with both byproducts and food processing. During the past three years, however, the urgency of the food dehydration work has caused us to devote by far the larger part of our attention to that one problem. Fundamental information about the drying characteristics of the important vegetables was obtained. Designs for dehydrators and other necessary plant equipment were worked out and given wide circulation. Plant procedures, organization, and operating costs were analyzed for the benefit of the new industry construction has passed, the attention of the engineering staff has turned more toward investigation of the newer methods of drying, such as spray drying, and toward work in the tech-

nology of food freezing and engineering studies and pilot plant development in some of the byproducts processes.

### Regional Laboratories and the Pulp and Paper Industry

It must have been evident at many points during the foregoing discussion that numerous activities in the Regional Laboratories may be important to the technical men in the pulp and paper industry. The following list of such contacts of interest is by no means exhaustive.

NORTHERN LABORATORY

1. Utilization of agricultural residues, such as straw, stalks, hulls, and cobs as pulps for specialty papers, corrugating, and container board, insulation and hard board, building materials, plastics, cork substitutes, and fermentable sugars. Dr. E. C. Lathrop is in charge of the work.
2. Production of moistureproof and heat-sealing paper coatings from vegetable oils.
3. Production of industrial alcohol and other fermentative products.
4. Fundamental chemical research on carbohydrates, with particular reference to corn and wheat starch utilization.

EASTERN LABORATORY

1. Production of synthetic resins and plasticizers.
2. Tannnig and tanning materials.

SOUTHERN LABORATORY

1. Fundamental properties of cellulose fibers.

WESTERN LABORATORY

1. Chemical research on hemicelluloses.
2. Packaging of frozen and dehydrated foods.
3. Production of yeast from sugary wastes.
4. Western hemlock tannin.

# Papers for the Laminating Industry*

By George Alexander[1]


### Abstract

*The materials used in the manufacture of laminated products are mentioned and reason is given for the choice of filler. There is a discussion of the three general manufacturing techniques: pressing of flat sheets or boards, molding of special shapes or forms, and the rolling and molding of tubes and rods.*


As is probably known, the laminated plastics industry is that branch of the great plastics family which deals with the manufacture of molded laminated structures used mainly because of their peculiar combination of excellent electrical characteristics with very good mechanical and decorative properties.

### Materials Used

A laminated plastic material consists of a filler or base (such as paper, cotton fabric, asbestos cloth, and of late, fabrics made of glass) and a thermo-setting binder which could be a phenol formaldehyde resin, or a urea or melamine formaldehyde reaction product. Every specific combination of a filler or base with any one of above mentioned resins exhibits its own particular combination of electrical and mechanical properties. It follows then that it is the ultimate application of the laminated product that determines the type of base or resin to be used in the manufacture of such a product. For instance, when papers are combined with phenolic resins, a product having excellent electrical characteristics and fair mechanical properties is obtained. When on the other hand, a glass cloth is combined with a melamine resin the result is a product with excellent mechanical properties and fair electrical characteristics.

PAPER

The papers used in the laminated plastics industry are known as saturating papers, papers that will readily and completely saturate when they come in contact with a resin solution or varnish as it is commonly known in the plastic field. This, of course, means that the papers must have a high porosity and be free of any fillers and binders such as clays, rosin, starch, and so forth.

Also, because of the fact that some of the resins used in the laminating industry (urea formaldehyde type) are sensitive to a change in pH, it becomes apparent that papers used with such resins must be neutral and free of any chemicals that may interfere with the proper function of the resins.

All papers used in the plastics industry are made according to rigid properties specifications and it is absolutely necessary that the paper manufacturer complies with the limits set in such specifications.

General Electric has, through long experience, established a control routine over all the raw materials used in the shop, including papers. Under no circumstances is the shop allowed to use any materials unless thoroughly tested and approved by the control laboratory. This is absolutely essential because of the fact that most of the production ultimately goes into Army and Navy applications.

When a shipment of paper is received, it is first thoroughly tested for the properties called for in the specifications for this particular paper.

When a new paper is introduced, every roll is tested; on small shipments of well established materials, every fifth roll; and on large shipments, every tenth roll. The papers are tested for width, caliper, air resistance, oil penetration, absorbency, color, wet tensile strength, moisture content, ash content, basis weight, and acidity. In addition, the papers have to have acceptable formation and be free of any dirt specks or shives. We are most particular about uniformity both across the sheet and in machine direction from roll to roll. The importance of uniformity will become apparent from a description of the process used for the manufacture of laminated plastics products.

### Laminating Process

A brief description of the process used by the plastics industry in the manufacture of laminated products is given. As mentioned before, the main ingredients going into the make-up of a laminated plastic material are a base or filler, such as paper, and a thermo-setting resin.

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The paper (supplied in rolls) is passed through a tank containing the resin solution where the paper is completely saturated. It then goes between two heavy squeeze rolls where the excess resin solution is squeezed off and then through a long tunnel drier where the solvent is driven off, and the resin advanced to the required stage. The dried resin-bearing paper is then wound up into rolls and placed aside for the next operation.

There are three general methods by which the resin-filled papers are used in the manufacture of laminated products: 1. Pressing of flat sheets or boards, 2. molding of special shapes or forms, and 3. rolling and molding of tubes and rods.

If the material is to be used in pressing of flat boards, it is cut into right length and sent over into the press room where sheets or boards ranging in thickness from 0.004 or 0.005 to 3 or 4 inches are molded using huge multiple opening hydraulic presses.

In the manufacture of molded shapes, the resin-filled paper is cut into definite patterns, piled up into the mold, and processed under heat and pressure.

If the material is to be used in the manufacture of tubes and rods, it is sent in roll form to the rolling machines. In the manufacture of tubes, the treated paper is wound around a steel mandrel applying some heat and pressure to stick the plys together and then baked in an over till the resin is completely cured. The steel mandrel is then pulled out and the laminated tube finished on a centerless grinder.

In the manufacture of rods, the treated paper is wound up on a thin steel mandrel, the mandrel withdrawn, and the material cured in special molds instead of in ovens as was the case with rolled tubes.

Depending upon the pressures used in pressing or molding of laminated products, a differentiation is made between high pressure, low pressure, and contact pressure methods.

In the high pressure method, the hydraulic pressure used runs between 1000 to 2000 p.s.i.; and in special cases as high as 3000 p.s.i. This is the method by which the bulk of laminated products are now manufactured.

In the low pressure method, the pressures used run between 100 to 250 p.s.i. This method is a rather new development, and it requires the use of resins with special characteristics.

In the contact method, the pressure used is only 1 to 5 p.s.i. This method is quite new and is still in an experimental stage. Here again special resins and molding technique are necessary.

All three main types of papers made by the paper industry; namely, rag, alpha, and kraft, are being used in the laminated plastics industry. In addition, there is now the high tensile papers made by the modified Mitscherlich process, a fact which illustrates quite well what can be accomplished when the paper and plastics industries get together.

### Papers Used

Of the three types of papers mentioned, probably the best suited for plastic manufacture are the rag papers. This is because of their very good wet strength, excellent color possibilities, and extremely good saturating properties. Laminated products made with rag papers have good mechanical and electrical properties and very good moisture resistance. The only factor that limits their wider application in the laminated plastics industry is their relatively high cost.

The so-called alpha papers have excellent saturating properties, excellent color possibilities, but have rather poor wet strength. Laminated products made with alpha papers have good electrical properties, comparatively good moisture resistance, and only fair mechanical properties. Their cost is also slightly on the high side. It might be mentioned here that both alpha and rag papers because of their clean cut colors are extensively used in the manufacture of decorative laminates.

Kraft saturating papers have good wet strength, good saturating properties, and last but not least—low cost. Laminated products made with kraft papers exhibit excellent electrical characteristics, good mechanical properties, and only fair moisture resistance.

The new modified Mitscherlich papers, when combined with special resins and molded at relatively low pressures exhibit unusually high mechanical properties, especially in tension and flexure.

### Choice of Fillers

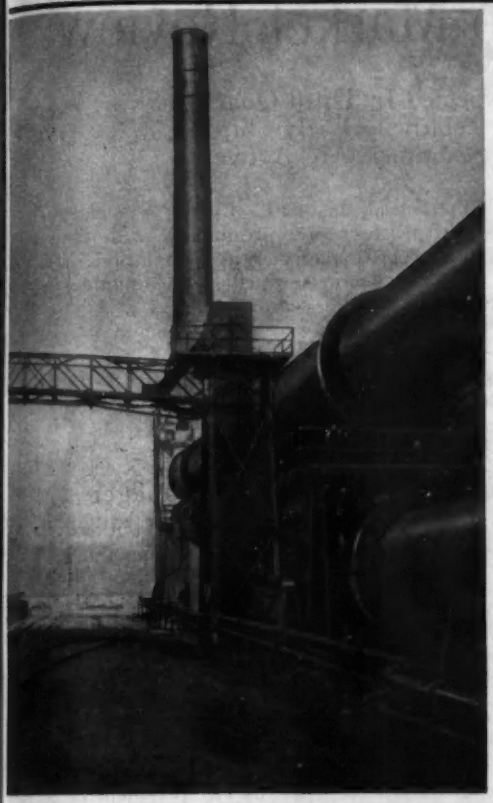
The main reason why laminators would rather use papers instead of cotton, asbestos, or glass fabrics is their low cost. In general, papers used by the laminating industry cost anywhere between 5 and 20 cents per pound while cotton textiles cost between 45 and 75 cents per pound with asbestos cloth at 60 cents to a dollar a pound, and glass fabrics at $1.00 to $5.00 a pound. In addition, paper base laminates exhibit electrical characteristics that are hard to match by any fabric base materials.

These two factors—low cost plus good electrical properties—put paper in a very favorable competitive position as far as the plastics industry is concerned.

The only reason why laminators use costly fabrics is because of some unusual properties obtained with these materials which properties paper has not been able to give. For instance, asbestos and glass fabrics are used mainly because of their heat resistance which, of course, springs from their inorganic nature. Because of this, papers cannot be considered in the same class with asbestos and glass fabrics.

When papers are compared with cotton fabrics, however, the story is slightly different. Here are two materials of the same chemical nature (both being cellulose) but with quite different effects upon the properties of laminated plastics products. Paper base laminates have excellent electrical properties, good flexural and tensile strengths, and low cost. Where paper falls short of the goal is in impact strength and bonding.

Not all jobs where plastic laminates are being used require high impact and bonding strengths, but the plastics industry would prefer to use a material that combines, in one, all those good mechanical and electrical properties that these various materials give individually. To a man like the author, who does not know much about either papers or cotton textiles, it would seem that the wide difference that exists between the cost of paper on one hand and that of cotton textiles on the other should provide incentive to the paper industry to try and overcome the aforementioned deficiencies of their product. Some progress has already been made in this direction by the development of the high tensile papers for low pressure laminates. However important this development may seem, in our estimation, it is only a "scratch on the surface."



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# New York Paper and Pulp Market Review

## Substantial Relief In Short Paper Supply Expected In Third Quarter—Prospect Appears Very Favorable For Relatively Early Shipments of Swedish Pulp — All Grades of Paper Stock Are Active.

Office of the PAPER TRADE JOURNAL,
Wednesday, June 6, 1945.

Shortages in major types of paper and paperboard continue to appear in all reports received from many manufacturers' representatives, jobbers, and general paper merchants during the current week. In a release of June 4, E. W. Tinker, executive secretary of the American Paper and Pulp Association stated in part that, "there has been an unusual economic phenomenon in the paper industry since 1941. This has involved a steady drop in profits. The entire situation is fundamentally due to the policy of OPA in considering all-over profits, rather than the profit situation with respect to individual items manufactured. Mr. Tinker further said that this has created unnecessary hardship among the customers of the paper industry and proved embarrassing to the manufacturers of paper.

The index of general business activity for the week ended May 26 declined to 143.4, from 144.3 for the previous week, compared with 143.4 for the corresponding week in 1944. The index of paperboard production was 164.1, compared with 163.7 for the previous week, and with 161.3 for the corresponding week in 1944.

Paper production for the week ended May 26 was estimated at 92.0%, compared with 90.0% for 1944, with 91.8% for 1943, with 91.4% for 1942, and with 96.8% for the corresponding week in 1941.

Paperboard production for the week ended May 26 was 93.0%, compared with 96.0% for 1944, with 95.0% for 1943, with 77.0% for 1942 and with 84.0% for the corresponding week in 1941.

### Wood Pulp

Wood pulp supply situation appears more favorable with better prospects for shipments of Swedish pulp at a relatively early date. Agreement on prices between the OPA and Swedish manufacturers appears incomplete at this date. Opinion in several informed quarters, however, reflects confidence that an equitable price schedule will shortly be established.

### Rags

Demand for new cotton cuttings continues active. Mill buying is steady. Prices are firm at ceiling levels in all grades.

The old cotton rag market is active. Roofing mills continue to absorb supplies freely. Demand for old whites and blues is reported steady at this date. Prices are firm at ceiling levels.

### Old Rope and Bagging

Demand continues urgent for all good Manila fiber available. Prices are firm at ceilings on major hard fibers.

More activity in scrap bagging is reported in some quarters. The market continues narrow and spotty. Prices are unchanged.

### Old Waste Paper

Paper and board mills are active buyers in the paper stock market at this date. Buying is steady in all grades of waste paper, presumably with the object of building up inventories in expectation of seasonally lower collections during the summer months. Prices are firm at ceiling levels.

### Twine

No change of importance has been reported in the twine market this week. Prices are relatively firm on most grades of twine.

## Southern Names Allin Sales Manager

BOSTON, Mass., June 4, 1945 — The Southern Advance Bag and Paper Company has appointed William M. Allin general sales manager with headquarters at Boston. For the last several years, Mr. Allin has been district sales manager for the company, with office in New Orleans.

The company has appointed Edwin D. Foster as assistant general sales manager. For approximately 20 years until 1941, Mr. Foster was with Southern Kraft as assistant to the sales manager in charge of bags. In 1941, he went with the Los Angeles Paper Corporation on the Pacific Coast as vice-president in charge of sales. In 1942, he came with the Southern Advance Bag and Paper Company as district sales manager with Metropolitan New York as his territory and offices in New York City.

Frank W. Peterschen, district sales manager in the New England territory, has retired. He has been succeeded by F. Bevan Howe, who has been in the sales department for a number of years. His office will be in Boston.

## WPB Limits Greeting Card Firm

The firm of Lutz and Sheinkman, 421 Hudson street, New York City, has been suspended by the issuance of Suspension Order S-785, for a period of one year during which their use of paper and paperboard will be sharply curtailed in the manufacture and packing of greeting cards. WPB took this action because of alleged violations of Limitation Order L-289 from January 1, 1944 through August 22, 1944.

WPB has stipulated in S-785 that Lutz and Sheinkman must reduce their use of paper by 9,878 pounds and paperboard by 679 pounds below what would otherwise be their permissible quotas in the second, third, and fourth quarters of 1945 and the first three months of 1945.

## Paper Cups Under Container Ruling

May 31, 1945—Quota restrictions on the use of fiber shipping containers for products listed in Schedule III of Order L-317 apply to paper cups unless these are made from sanitary food container stock as defined in Appendix B of Order M-241, the War Production Board said today, in issuing Direction 4 to L-317.

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Photo Courtesy of Commercial Solvents Corporation

Safeguarding *the life saver* with Straps of Steel

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While paper may not be as "urgent" as life-saving drugs, the need for protecting it in transit is extremely important in these days of scarcity. Use Stanley – the time-tested Steel Strapping that includes materials and tools for every application. The Stanley Works, Steel Strapping Division, New Britain, Connecticut.

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## MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, June 6, 1945.

BLANC FIXE—Quotations on blanc fixe continue unchanged. Demand is fair this week. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—Current demand is active. Supply situation good. March output up at 2,950,000 pounds. Quotations continue unchanged. Prices on bleaching powder range from $2.50 to $3.10 per 100 pounds, in drums, car lots, at works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b. shipping point.

CAUSTIC SODA — Demand continues very heavy. Production high but below current needs. Boxcar shortage still delay shipments. Solid caustic soda is quoted at $2.30 per 100 pounds; flaked and ground is quoted at $2.70 per 100 pounds; all in drums, car lots, at works.

CHINA CLAY — Quotations on china clay are unchanged. Current demand is reported fair. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mine. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Demand heavy with essential requirements met. March output up at 107,466 tons. Quotations are unchanged. Chlorine is currently quoted at $1.75 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—No offerings or sales at unchanged OPA ceiling prices. "G" gum rosin at $5.79 per 100 pounds, in barrels, at Savannah; "FF" rosin at $5.75 per 100 pounds in barrels, at New York; seventy per cent gum rosin size at $5.95 per 100 pounds, f.o.b. works.

SALT CAKE — Prices on salt cake are reported unchanged for the current week. Consumption is reported moderate at this date. Domestic salt cake is quoted at $15 per ton, in bulk. Chrome salt cake is quoted at $16 per ton. All prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand continues for all-over requirements. March output up at 218,540 tons. Bulk lot shipments prompt. Bagged lots slow. Quotations continue unchanged. Current prices, car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Current corn receipts are less this week; shipments reported improved. Prices more firm at this date. Starch prices continue unchanged. The pearl grade is quoted at $3.72 per 100 pounds; powdered starch at $3.83 per 100 pounds; all prices in bags, car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA — Demand reported good. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.25 per 100 pounds, in bags, car lots, f.o.b. works. The iron free is currently quoted at $1.85 per 100 pounds, in bags, at works.

SULPHUR—Quotations on sulphur continue to conform to prevailing market prices. Demand active. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price at Gulf Ports is $17.50 per long ton.

TALC—Prices on talc continue unchanged. Demand good. Domestic grades are currently quoted at from $16 to $21 per ton at mines; Canadian at $24 per ton. All prices in car lots.

## MARKET QUOTATIONS

**All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.**

### Paper

(Delivered New York)

| | | | |
|---|---|---|---|
| **Standard News, per ton—** | | | |
| Roll, contract | *$61.00 | @ | — |
| Sheets | 69.00 | @ | — |
| * OPA Maximum Price. | | | |
| **Kraft—per cwt.—Carload Quantities Zone A, Delivered** | | | |
| Superstandard Wrapping | *$5.25 | @ | — |
| No. 1 Wrapping | *5.00 | " | — |
| Standard Wrapping | *4.75 | " | — |
| Standard Bag | *4.375 | " | — |
| * OPA Manufacturers' Prices. | | | |
| **Tissues—Per Ream—Carlots** | | | |
| White No. 1 | 1.12½ | " | — |
| White No. 1 M. G. | 1.10 | " | — |
| White No. 1½ | 1.00 | " | — |
| White No. 2 | .90 | " | — |
| Anti-Tarnish M.F. | 1.20 | " | — |
| Colored | — | " | — |
| Kraft | .95 | " | — |
| Manila | .90 | " | — |
| **Toilet—1 M. Sheets—Per Case** | | | |
| Unbleached | 4.25 | " | — |
| Bleached | 5.70 | " | — |
| Unbl. Toilet, 1 M. | 4.16 | " | — |
| Bleached Toilet | 5.70 | " | — |
| **Paper Towels, Per Case—** | | | |
| Unbleached, Jr. | 2.20 | " | — |
| Bleached, Jr. | 3.20 | " | — |
| **Manila—per cwt.—C. l. f. a.** | | | |
| No. 1 Jute | 11.25 | @ | — |
| No. 1 Manila Wrapping, 35 lb. | 6.00 | " | 6.25 |
| No. 2 Manila Wrapping, 35 lb. | 5.75 | " | 6.00 |
| **Boards, per ton—** | | | |
| News | *$50.00 | @ | — |
| Chip | *$50.00 | " | — |
| Sgl. Mla. Lt. Chip | *62.00 | " | — |
| White Pat. Coated | *75.00 | " | — |
| Kraft Liners 50 lb. | *63.00 | " | — |
| Binders Boards | 84.00 | " | 116.00 |

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

**Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:**

| | Bonds | | Ledgers | |
|---|---|---|---|---|
| 100% Rag Est. No. 1 | $39.10 | @ $46.00 | $40.25 | @ $47.25 |
| 100% Rag | 32.20 " | 37.75 | 33.35 " | 39.25 |
| 85% Rag | .... " | .... | 29.90 " | 35.00 |
| 75% Rag | 23.00 " | 27.00 | 24.15 " | 28.25 |
| 65% Rag | .... " | .... | 22.80 " | 27.75 |
| 50% Rag | 18.70 " | 22.75 | 19.90 " | 24.25 |
| 25% Rag | 16.40 " | 20.00 | 17.55 " | 21.50 |

Colors at $1.00 cwt. extra.

**Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:**

| | Bonds | | Ledgers | |
|---|---|---|---|---|
| No. 1 | $10.55 | @ $12.75 | $11.70 | @ $14.25 |
| No. 2 | 9.65 " | 11.75 | 10.80 " | 13.25 |
| No. 3 | 9.20 " | 11.25 | 10.35 " | 12.50 |
| No. 4 | 8.90 " | 10.75 | 10.05 " | 12.25 |

Colors $1.00 cwt. extra.

**Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:**

| | | | |
|---|---|---|---|
| No. 1 Glossy Coated | $13.65 | @ | $13.91 |
| No. 2 Glossy Coated | 12.40 " | | 14.06 |
| No. 3 Glossy Coated | 11.60 " | | 13.31 |
| No. 4 Glossy Coated | 11.15 " | | 12.71 |
| No. 1 Antique (watermarked) | 10.25 " | | 11.71 |
| No. 2 Offset | 9.60 " | | 11.06 |
| A Grade E. F. | 9.35 " | | 10.71 |
| A Grade S. & S. C. | 9.60 " | | 11.06 |
| B Grade E. F. | 8.85 " | | 10.31 |
| B Grade S. C. | 9.10 " | | 10.56 |
| C Grade E. F. | 8.55 " | | 9.71 |
| C Grade S. C. | 8.80 " | | 10.00 |
| D Grade E. F. | 8.25 " | | 9.50 |
| D Grade S. & S. C. | 8.50 " | | 9.71 |

Ivory & India at $.50 cwt. extra.

### Wood Pulp

**OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.**

| | | | |
|---|---|---|---|
| Bl. Softwood Sulphite | | | $86.00 |
| Unbl. Softwood Sulphite | | | 74.00 |
| Bl. Hardwood Sulphite | | | 83.50 |
| Unbl. Hardwood Sulphite | | | 71.50 |
| Bl. Mitscherlich | | | 81.00 |
| Unbl. Mitscherlich | 72.00 | @ | 82.00 |
| N. Bleached Sulphate | | | 86.00 |
| S. Bleached Sulphate | | | 79.00 |
| N. Semi-Bleached Sulphate | | | 82.00 |
| S. Semi Bleached Sulphate | | | 75.00 |
| N. Unbl. Sulphate | | | 73.00 |
| S. Unbl. Sulphate | | | 63.50 |
| Bl. Soda | | | 76.00 |
| Unbl. Soda | | | 72.00 |
| Groundwood | | | 50.00 |

**Transportation Allowances**

**Applying to Producers of Wet Wood Pulp.**

| | Below 50% Air Dry Weight | 50%-80% Air Dry Weight | Above 80% Air Dry Weight |
|---|---|---|---|
| Northeast | $13.50 | 11.50 | $8.50 |
| Lake Central | 13.50 | 11.50 | 8.50 |
| Southern | 16.00 | 14.00 | 11.00 |
| West Coast (in area) | 10.50 | 9.50 | 7.50 |
| West Coast (out area) | 16.50 | 15.50 | 13.50 |

**Applying to Producers of Dry Wood Pulp.**

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

### Domestic Rags

**New Rags**

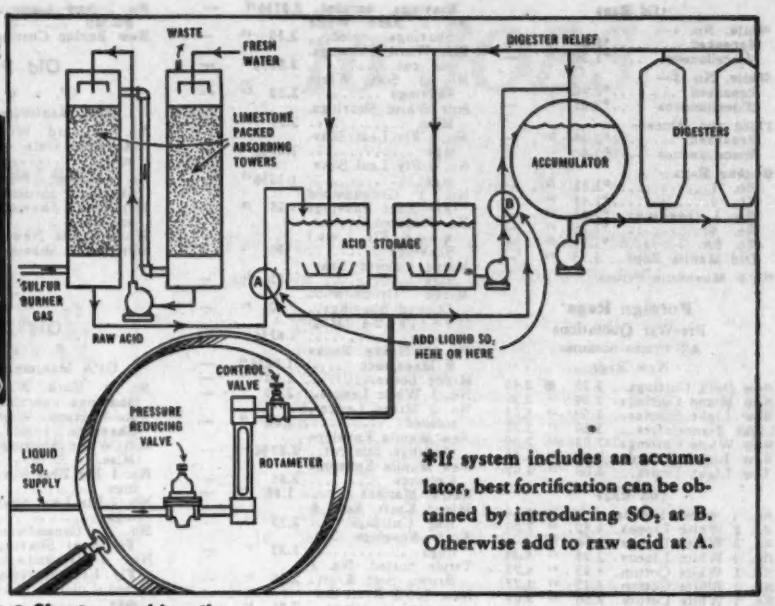
(Prices to Mill f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White, No. 1 | 6.50 | @ | 7.25* |
| Silesias No. 1 | — | " | 5.75* |
| New Unbleached | 6.75 | " | 7.50* |
| Blue Overall | — | " | 5.50* |
| Fancy | — | " | 5.50* |
| Washables | — | " | 3.00* |
| Bleached Khaki Cuttings | — | " | 4.25* |
| Unbleached Khaki Cuttings | — | " | 3.50* |

*OPA Maximum Prices

## Mr. Sulphite Pulp Mill Operator:

that ADDITIONAL FREE $SO_2$ you need is easy... this ANSUL way




*If system includes an accumulator, best fortification can be obtained by introducing $SO_2$ at B. Otherwise add to raw acid at A.

Install an Ansul constant $SO_2$ concentration system to augment your present capacity.

It's easy to set up, clean to operate, and efficient and economical to use.

Ansul $SO_2$ is quickly and completely absorbed because of its purity—99.9+% (by wt.) pure.

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Printers praise the improved surface of papers made with PQ silicate. Investigate now how you can improve quality and at the same time obtain a greater yield. Detailed bulletin sent on request.

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CAUSTIC SODA
FOR PULP & PAPER

STAUFFER CHEMICAL COMPANY
(NIAGARA DIVISION)

420 [illegible], New York 17, N.Y. ... Chicago 1, Illinois

### Old Rags

| | | | |
|---|---|---|---|
| White, No. 1— | | | |
| Repacked | *3.00 | cwt | — |
| Miscellaneous | *2.90 | cwt | — |
| White, No. 2— | | | |
| Repacked | *2.90 | cwt | — |
| Miscellaneous | *2.65 | bale | — |
| Third and Blues— | | | |
| Repacked | *2.20 | bale | — |
| Miscellaneous | *1.80 | cwt | — |
| Roofing Rags— | | | |
| No. 1 | *1.55 | cwt | — |
| No. 2 | *1.45 | cwt | — |
| No. 3 (bagging) | *1.35 | cwt | — |
| No. 4 | *1.35 | cwt | — |
| No. 5A | *1.35 | bale | — |
| Old Manila Rope | 5.75 | cwt | — |

*OPA Maximum Prices.

### Foreign Rags

Pre-War Quotations

All Prices nominal

New Rags

| | | | |
|---|---|---|---|
| New Dark Cuttings | 2.25 | @ | 3.40 |
| New Mixed Cuttings | 2.00 | cwt | 2.20 |
| New Light Silesias | 5.50 | cwt | 5.75 |
| Light Flannelettes | 5e50 | cwt | 5.75 |
| New White Cuttings | 7.00 | cwt | 7.50 |
| New Light Oxfords | 4.00 | cwt | 4.50 |
| New Light Prints | 3.00 | cwt | 3.25 |

Old Rags

| | | | |
|---|---|---|---|
| No. 1 White Linens | 7.50 | cwt | 8.50 |
| No. 2 White Linens | 6.50 | cwt | 7.50 |
| No. 3 White Linens | 4.50 | cwt | — |
| No. 4 White Linens | 2.25 | cwt | 3.25 |
| No. 1 White Cotton | 4.25 | cwt | 4.75 |
| No. 2 White Cotton | 3.25 | cwt | 3.75 |
| No. 3 White Cotton | 2.50 | cwt | 3.00 |
| No. 4 White Cotton | 1.90 | cwt | 2.20 |
| Extra Light Prints | 2.00 | cwt | 2.40 |
| Ord. Light Prints | 1.75 | cwt | 2.15 |
| Med. Light Prints | 1.55 | cwt | 1.95 |
| Dutch Blue Cottons | 2.25 | cwt | 2.50 |
| French Blue Linens | 3.00 | cwt | — |
| Checks and Blues | 3.00 | cwt | — |
| Linsey Garments | 1.90 | cwt | 2.00 |
| Dark Cottons | 1.50 | cwt | 1.60 |
| Old Shopperies | 1.30 | cwt | 1.45 |
| New Shopperies | 1.45 | cwt | 1.50 |
| French Blues | 2.25 | cwt | 2.50 |

## BAGGING

(Prices to Mill, f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Gunny No 1— | | | |
| Foreign | — | cwt | — |
| Domestic | 3.25 | @ | 3.30 |
| Wool Tares, light | 3.25 | cwt | 3.50 |
| Wool Tares, heavy | 3.50 | cwt | 3.75 |
| Bright Bagging | 3.25 | cwt | 3.50 |
| Manila Rope— | | | |
| Foreign | — | cwt | — |
| Domestic | *5.75 | cwt | — |
| Jute Threads | 5.50 | cwt | — |
| No. 1 Sisal Strings | *4.00 | cwt | — |
| Mixed Strings | 2.00 | cwt | — |

*OPA Maximum Price.

### Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

| | | | |
|---|---|---|---|
| No. 1 Hard White Envelope Cuts, one cut | 3.37½ | @ | — |
| No. 1 Hard White Envelope Cuts | 3.12½ | cwt | — |
| No. 1 Hard White Shavings, unruled | 2.87½ | cwt | — |
| No. 1 Hard White Shavings, ruled | 2.50 | cwt | — |
| Soft White Shavings, one cut | 2.87½ | cwt | — |
| No. 1 Soft White Shavings | 2.50 | cwt | — |
| Soft White Shavings, Misc. | 2.15 | bale | — |
| No. 1 Fly Leaf Shavings | 1.67½ | cwt | — |
| No. 2 Fly Leaf Shavings | 1.12½ | cwt | — |
| No. 1 Groundwood Fly Leaf Shavings | 1.25 | cwt | — |
| No. 2 Mixed Groundwood Fly Leaf Shavings | .90 | cwt | — |
| Mixed Colored Shavings | .75 | bale | — |
| Mixed Groundwood Colored Shavings | .90 | bale | — |
| Overissue Magazines | 1.67½ | cwt | — |
| No. 1 Heavy Books & Magazines | 1.92½ | cwt | — |
| Mixed Books | 1.10 | cwt | — |
| No. 1 White Ledger | 2.30 | cwt | — |
| No. 2 Mixed Ledger, colored | 2.00 | cwt | — |
| New Manila Envelope Cuttings, one cut | 2.87½ | cwt | — |
| New Manila Envelope Cuttings | 2.65 | cwt | — |
| Extra Manilas | 1.95 | cwt | — |
| Mixed Kraft, Env. & Bag Cuttings | 2.75 | cwt | — |
| Kraft Envelope Cuttings | 3.25 | cwt | — |
| Triple Sorted, No. 1 Brown Soft Kraft | 2.50 | bale | — |
| New 100% Kraft Corrugated Cuttings | 3.25 | bale | — |
| No. 1 Assorted Old Kraft | 1.75 | cwt | — |
| New Jute Corrugated Cuttings | .90 | cwt | — |
| Old 100% Kraft Corrugated Containers | 1.75 | cwt | — |
| Old Corrugated Containers | 1.40 | cwt | — |
| Box Board Cuttings | .72½ | cwt | — |
| White Blank News | 1.65 | cwt | — |
| Overissue News | 1.10 | cwt | — |
| No. 1 News | 1.00 | cwt | — |
| No. 1 Mixed Paper | .95 | cwt | — |
| Old Corrugated Containers | .82½ | cwt | — |
| Mill Wrappers | 1.10 | cwt | — |

### Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

| | | | |
|---|---|---|---|
| Coarse Polished— | | | |
| India | .21 | @ | — |
| White Hemp | .21 | @ | — |
| Fine Polished— | | | |
| Fine India | .34 | cwt | — |
| Unpolished— | | | |
| Box | .17½ | cwt | — |
| Paper Makers | .17 | cwt | — |
| Tube Rope | .1b | cwt | — |
| Wall Paper | .20½ | cwt | — |
| Wrapping | .23 | cwt | — |
| Soft Fiber Rope | .19 | cwt | — |
| Cotton | .25 | cwt | — |

(Hard Fiber)

| | | | |
|---|---|---|---|
| Medium Java | .18 | cwt | — |
| Mex. Sisal | .16 | cwt | — |
| Manila | — | bale | — |

## PHILADELPHIA

### Domestic Rags (New)

(Price to Mill.)

| | |
|---|---|
| Shirt Cuttings— | |
| New White No. 1 | .07½ |
| New White No. 2 | .05¾ |
| Light Silesias | .05¾ |
| Black Silesias, soft | .03¾ |
| New Unbleached | .07½ |
| Washable Prints | .04¾ |
| Washable No. 1 | .03 |
| Blue Overall | .05½ |
| Cottons—According to grades— | |
| Washable shredding | .01¾ |
| Fancy Percales | .04¾ |
| New Black Soft | .03¾ |
| Khaki Cuttings— | |
| Unbleachable Cotton Cuttings | .03½ |
| Bleachable Cotton Cuttings | .04¾ |
| Men's Corduroy | .03½ |
| Ladies' Corduroy | .03 |
| Cottonades | .03¾ |

### Domestic Rags (Old)

| | | | |
|---|---|---|---|
| White No. 1—Repacked | 3.00 | cwt | — |
| Miscellaneous No. 1 | 1.30 | cwt | — |
| Miscellaneous No. 2 | 1.65 | cwt | — |
| White No. 2—Repacked | 2.90 | bale | — |
| Thirds and Blues— | | | |
| Miscellaneous | 1.80 | cwt | — |
| Repacked | 2.20 | cwt | — |
| Black Stockings— | | | |
| (Export) | Nominal | | |
| Roofing Stock— | | | |
| Foreign No. 1 | Nominal | | |
| Domestic No. 1 | 1.55 | bale | — |
| Domestic No. 2 | 1.45 | bale | — |
| Roofing Bagging | 1.35 | cwt | — |
| Old Manila Rope | 5.75 | cwt | — |

### Bagging

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign | Nominal | | |
| Domestic | 3.00 | cwt | 3.50 |
| No. 1 Clean bright— | | | |
| Sisal Strings | | | .04 |
| No. 2 Clean bright— | | | |
| Sisal Strings | | | .03 |
| Sisal Jute | .02½ | cwt | .02¾ |
| Scrap— | | | |
| No. 1 | 3.25 | bale | 3.50 |
| No. 2 | 1.75 | cwt | 1.90 |
| Wool Tares heavy | 4.00 | cwt | 4.25 |
| No. 1 New Light Burlap | 3.00 | cwt | 4.00 |
| New Burlap Cuttings | 3.75 | cwt | 4.00 |

### Old Papers

(F. o. b. Phila)

OPA Maximum Prices, Baled

| | | | |
|---|---|---|---|
| No. 1 Hard White Envelope Cuts, one cut | 3.37½ | cwt | — |
| No. 1 Hard White Shavings, unruled | 2.87½ | cwt | — |
| Soft White Shavings, one cut | 2.50 | cwt | — |
| White Blank News | 1.65 | cwt | — |
| Soft White Shavings | | | |
| Misc. | 2.15 | cwt | — |
| No. 1 White Ledger | 2.30 | cwt | — |
| No. 2 Ledger, colored | 2.00 | cwt | — |
| No. 1 Heavy Books & Magazines | 1.92½ | cwt | — |
| Overissue Magazines | 1.67½ | cwt | — |
| New Manila Envelope Cuttings | 2.65 | cwt | — |
| No. 1 Assorted Old Kraft | 1.75 | cwt | — |
| No. 1 Mixed Paper | .95 | cwt | — |
| Box Board Cuttings | .72½ | cwt | — |
| Kraft Corrugated Cuttings | 2.25 | cwt | — |
| Old Corrugated Containers | 1.40 | cwt | — |
| Overissue News | 1.10 | cwt | — |
| No. 1 News | 1.00 | cwt | — |

## BOSTON

### Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

| | | | |
|---|---|---|---|
| No. 1 Hard White Shavings, unruled | 2.87½ | @ | — |
| No. 1 Hard White Shavings, ruled | 2.50 | cwt | — |
| Soft White Shavings, Misc. | 2.15 | cwt | — |
| No. 1 Fly Leaf Shavings | 1.67½ | cwt | — |
| No. 2 Fly Leaf Shavings | 1.12½ | cwt | — |
| No. 1 Groundwood Fly Leaf Shavings | 1.25 | cwt | — |
| No. 2 Groundwood Fly Leaf Shavings | .90 | cwt | — |
| Mixed Colored Shavings | .75 | cwt | — |
| New Manila Envelope Cuts, one cut | 2.87½ | cwt | — |
| Hard White Envelope Cuts, one cut | 3.37½ | cwt | — |
| Triple Sorted No. 1 Brown Soft Kraft | 2.50 | bale | — |
| Mixed Kraft Env. & Bag Cuttings | 2.75 | cwt | — |
| Kraft Envelope Cuttings | 3.25 | cwt | — |
| No. 1 Heavy Books & Magazines | 1.92½ | cwt | — |
| New Manila Envelope Cuts, one cut | 2.87½ | cwt | — |
| New Manila Envelope Cuttings | 2.65 | bale | — |
| White and Colored Tabulating Cards | 2.25 | cwt | — |
| Ground Wood Tabulating Cards | 1.35 | cwt | — |
| White Blank News | 1.65 | cwt | — |
| No. 1 Assorted Old Kraft | 1.75 | cwt | — |
| No. 1 Mixed Paper | .95 | cwt | — |
| Overissue News | 1.10 | cwt | — |
| Box Board Cuttings | .72½ | cwt | — |
| New Corrugated Cuttings, Kraft | 2.25 | bale | — |
| Old 100% Kraft Corrugated Containers | 1.75 | cwt | — |
| Old Corrugated Containers | 1.40 | cwt | — |
| Jute Corrugated Cuttings | 1.07½ | cwt | — |

### Bagging

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Gunny Bagging— | | | |
| Foreign | (nominal) | | |
| Domestic | 2.75 | @ | 2.90 |
| Sisal Rope No. 1 | *4.75 | cwt | — |
| Sisal Rope No. 2 | * — | cwt | 4.00 |
| Mixed Rope | — | cwt | 1.55 |
| Transmission Rope— | | | |
| Foreign | (nominal) | | |
| Domestic | 2.75 | cwt | 3.00 |
| Manila Rope— | | | |
| Foreign | (nominal) | | |
| Domestic | 5.75 | cwt | |
| Soft Jute Rope | 4.50 | cwt | 5.00 |
| Jute Car Threads | 3.00 | cwt | 3.50 |
| Bleachery Burlap | 8.50 | cwt | 9.00 |
| Scrap Burlap— | | | |
| Foreign | (nominal) | | |
| Domestic | 3 | cwt | 3.25 |
| South American | — | cwt | 3.25 |
| Wool Tares— | | | |
| Foreign | (nominal) | | |
| Domestic | 4.25 | | |
| Aust. Wool Pouches | — | cwt | 3.65 |
| New Zealand Wool Pouches | — | cwt | 3.35 |
| New Burlap Cuttings | 4.75 | cwt | 5.00 |
| Heavy Baling Bagging | 4.00 | cwt | 4.25 |
| Paper Mill Bagging | 2.50 | cwt | 3.00 |
| No. 2 Roofing Bagging | 1.35 | cwt | — |

*OPA Maximum Price.

### Domestic Rags (New)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New Light Prints | .04½ | @ | .04¾ |
| Fancy Percales | .04¼ | cwt | .04 |
| New White No 1 | .06¼ | cwt | .07 |
| New Light Flannelettes | .05¼ | cwt | .05 |
| Canton Flannels, Bleached | .06 | cwt | .06½ |
| Underwear Cutters, Bleached | .06¼ | cwt | .06¾ |
| Underwear Cutters, Unbleached | .05¼ | cwt | .06 |
| Silesias No. 1 | .06 | cwt | .06½ |
| New Black Silesias | .03 | cwt | .03½ |
| Red Cotton Cuttings | .03½ | cwt | .04 |
| Soft Unbleached | .06½ | cwt | .06½ |
| Blue Cheviots | .05½ | cwt | .06 |
| Fancy | .02¾ | cwt | — |
| Washable | .02¾ | cwt | — |
| Khaki Cuttings | .02¾ | cwt | .03 |
| O. D. Khaki | .03½ | cwt | .03½ |
| Corduroy | .03¼ | cwt | .03½ |
| New Canvas | .06½ | cwt | .06½ |
| U. V. D. Cuttings | .06½ | cwt | .06½ |

### Domestic Rags (Old)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| White No. 1— | | | |
| Repacked | 3.00 | @ | — |
| Miscellaneous | 1.30 | cwt | — |
| White No. 2— | | | |
| Miscellaneous | 2.65 | bale | — |
| Twos and Blues, Repacked | 2.20 | bale | — |
| Old Blue Overalls | 2.25 | cwt | 4.00 |
| Thirds and Blues, Repacked | 2.20 | cwt | — |
| Miscellaneous | 1.80 | cwt | — |
| Black Stockings | 3.50 | bale | 4.00 |
| Roofing Stock— | | | |
| No. 1 | 1.55 | cwt | — |
| No. 2 | 1.45 | cwt | — |
| No. 3 | 1.35 | cwt | — |
| No. 4 | 1.35 | cwt | — |
| No. 5, Quality A | 1.35 | cwt | — |
| Quality B | 1.20 | cwt | — |
| Quality C | .95 | cwt | — |
| Old Manila Rope | 5.75 | cwt | — |

*OPA Maximum Prices.

### Foreign Rags

(F. o. b Boston)

| | |
|---|---|
| Canvas | (nominal) |
| Dark Cottons | (nominal) |
| Dutch Blues | (nominal) |
| New Checks and Blues | (nominal) |
| Old Fustians | (nominal) |
| Old Linsey Garments | (nominal) |
| New Silesias | (nominal) |

## CHICAGO

### Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White Envelope Cuts, one cut | 1.37½ | cwt | — |
| No. 1 Hard White Shavings, unruled | 2.87½ | cwt | — |
| No. 1 Soft White Shavings | 2.50 | cwt | — |
| No. 1 White Ledger | 2.30 | cwt | — |
| No. 1 Heavy Books & Magazines | 1.92½ | cwt | — |
| White Blank News | 1.65 | cwt | — |
| Mixed Kraft Env. & Bag Cuttings | 2.75 | bale | — |
| No. 1 Assorted Old Kraft | 1.75 | bale | — |
| Overissue News | 1.10 | cwt | — |
| No. 1 News | 1.00 | cwt | — |
| No. 1 Mixed Paper | .95 | cwt | — |
| No. 1 Roofing Rags | 1.35 | cwt | — |
| No. 1 Roofing Bags | 1.45 | bale | — |

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MACHINE TENDER for cylinder machine operations. Must be experienced at this particular kind of machine operations. Prefer high school graduate or equivalent. Address Box 45-293 care Paper Trade Journal. TF

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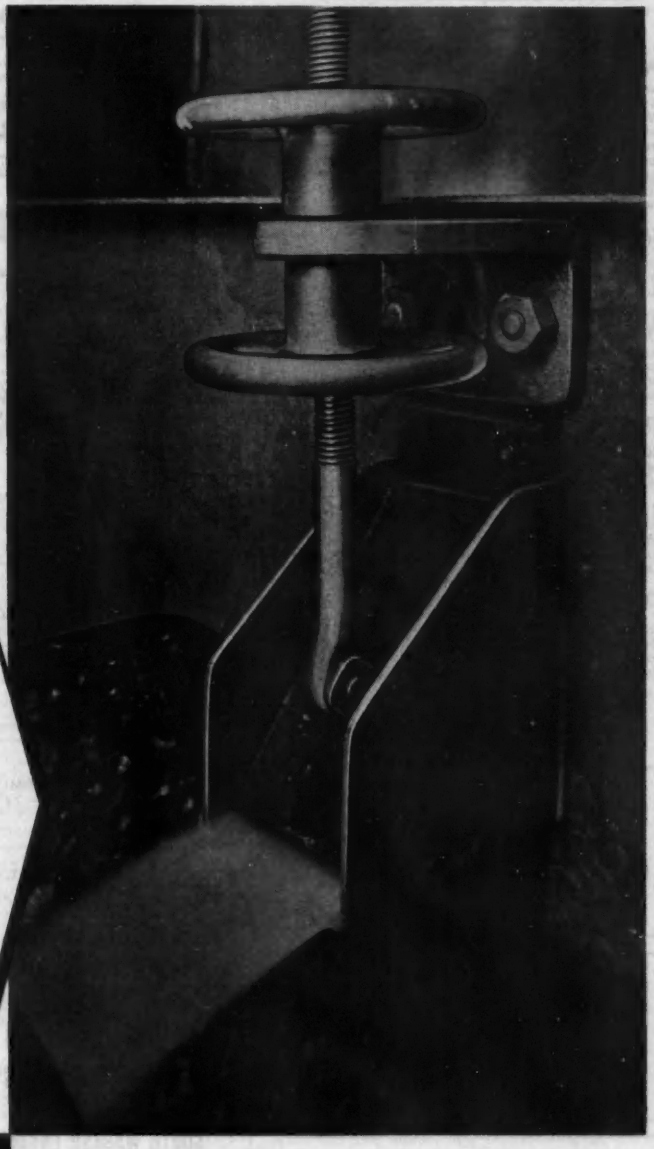
WANTED—Position in Control Work. Fifteen years experience in pulp, paper and explosives manufacturing, doing technical control, production supervision and quality control work. College graduate. Protestant. Address Box 45-332 care Paper Trade Journal. J-14

PRODUCTION MAN—32. Thoroughly experienced in production, supervision and merchandising of envelopes, papeteries, fine stationery. Available at once. Address Box 45-324, care Paper Trade Journal. J-7

BEATER ROOM FOREMAN or Beater Engineer—Accustomed to all grades. Good on colors. Age 50. Married. Address Box 45-315 care Paper Trade Journal. J-14

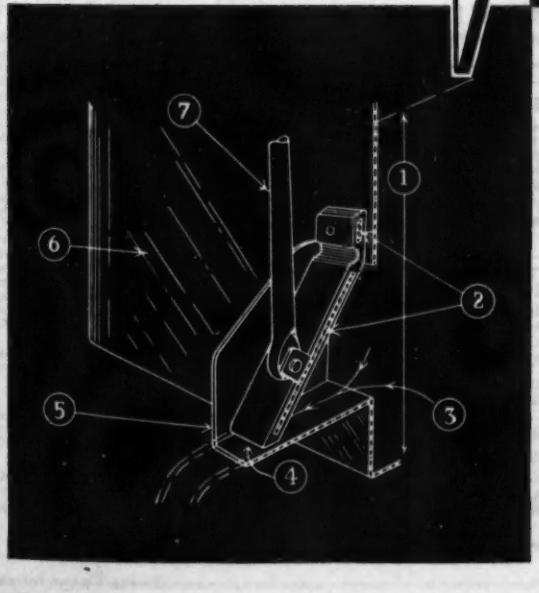
# SHARTLE MOLDED RUBBER HEAD BOX GATE

***Hundreds in Service and Doing Good Job***



**FEATURES**

1. Fixed head maintains constant spouting velocity.
2. Metal inserts molded in resilient rubber.
3. No obstruction in stream flow.
4. Flow can be metered to close tolerances or closed entirely.
5. Die-formed stainless steel lip.
6. Readily washed up from both inside and outside . . . no lodgements.
7. Stainless steel adjusting rod.




The Shartle molded rubber head box gate exhibited at 1940 convention, has now been through the "fire" of mill service for five years and certainly has proved its worth.

If you want a close control, self-cleaning and non-clogging gate at reasonable cost, the Shartle is your gate.

Further particulars to interested mills.

## SHARTLE BROTHERS MACHINE CO.

Middletown, Ohio.

Dilts

Dilts Machine Works, Fulton, N. Y.
Divisions of Black-Clawson Co.,
Hamilton, Ohio.

## SITUATIONS WANTED

CHEMIST—B. S. in Chem. Graduate training in Pulp and Paper School. 10 years experience in pulp and paper mill and converting plants. Practical experience with thermoplastic and thermosetting resins and all types of adhesives. Graduate training in Management Subjects. Wishes position with a future with progressive company. Employed but available on short notice. Age 32. Classified II-B. Family. Address Box 45-298 care Paper Trade Journal. J-7

FOREMAN FINISHER—Twenty years diversified experience, proficient operator and instructor, clerical, scheduling, warehousing, shipping, inventories, etc. Resume on request. Address Box 45-318 care Paper Trade Journal. J-28

MAN 41, with 20 years supercalender and finishing experience, desires to locate from large city. Capable of handling mechanical, quality and engineering problems on supercalenders. Address Box 45-319 care Paper Trade Journal. J-14

PAPER CONVERTING FOREMAN—18 years experience paper cutting, straight and die cutting. Many years successful handling of men. Seeks position Metropolitan Area. Address Box 45-276 care Paper Trade Journal. J-28

14 YEARS paper converting experience, thoroughly familiar with manufacture of wax-oil paper, aniline printing, envelopes, papeteries. Post war ideas. Chemical experience. Address Box 45-325 care Paper Trade Journal. J-28

POWER SUPERINTENDENT—Background of 23 years experience in the Paper and Pulp industry in engineering and maintenance capacity. Qualified and experienced in supervising power, construction, maintenance and operation. Address Box 45-323 care Paper Trade Journal. J-14

## WANTED

**WANTED**

**CALENDER STOCK—10" INTERMEDIATE ROLL MINIMUM**
**ALSO**
**SHEETER—SINGLE OR DOUBLE CUT-OFF BOTH FOR 72" MACHINE**

**Address Box 44-728 care Paper Trade Journal.** TF

**WANTED**

**4 to 6 Cylinder Machine, trimming about 68" or wider.**

**Shartle Brothers Machine Co.**
**Middletown, Ohio**
J-28

**WANTED**

**100" Fourdrinier Paper Machine or slightly less to make approximately 20 tons of paper. Prefer reel and no cutter. Beating and stock preparation unimportant.**

**ARNO W. NICKERSON**
**441 Lexington Ave.**
**New York 17, N. Y.**
**MUrray Hill 2-6522**
J-7

WANTED — DISCARDED PAPER MILL FELTS. HIGHEST PRICES paid for all kinds of discarded paper mill felts. LARGE or SMALL QUANTITIES accepted. Prices quoted immediately on receipt of samples. ADDRESS: GLASER AND YOFFE, INC., 80 NORTH MAIN ST., NATICK, MASS. TF

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 44-835 care Paper Trade Journal tf

WANTED—Late Model Cameron Slitting and Rewinding Machine or similar machine of other manufacture that will handle rolls of paper up to 60" in width. Narragansett Coated Paper Corp., Pawtucket, R. I. J-21

## WANTED

WANTED—Brightwood Box Machine. Address Box 44-836 care Paper Trade Journal. tf

## FOR SALE

**FOR SALE**

3—64" and two 86" Hamblet cutters with pilers
1—120" Hamblet box frame single cutter with slitter attachment, also Hamblet layboy and overlapping device, in very good condition.
8—Dryers 36 x 108"
18—Dryers 36 x 82" with frames and gears
2—Norwood platers, 44", with reversing motors, new 1928.
35—Table rolls 4 x 84"
23—Table rolls 6 x 120"
1—60" Voith inlet.
6—Rubber covered press rolls 14 x 87" and 2—14 x 84".
2—12 plate Harmon screens
2—Moore & White rotary screens
1—61 x 48" Jones beater with wood tub, corrugated bars
1—60 x 60" Horne patent beater with bronze bars, 4" tub.
1—75 HP 550 volt squirrel cage motor with rheostat.
1—Sturtevant pulp shredder
1—Industrial Shredder, without motor or switch

**FRANK H. DAVIS COMPANY**
**175 Richdale Ave., Cambridge 40, Mass.**
J-14

**FOR SALE**

44" Oswego Automatic Power Cutter.
44" Seybold Holyoke Auto. Power Cutter.
45" White Automatic Power Cutter.
63" Oswego Mill Type Cutter, power back guage.
86" Clark Sheeter with Back-Stand.
80" Finley Sheeter.
110" Hamblet heavy duty Sheeter with backstand.
50" Moore & White 2-drum Rewinder.
120" Moore & White 4-drum Rewinder.
68" Rice Barton & Fales Slitter & Rewinder, for use on dry end of paper machine.
36" Waldron Embosser.
4 Waldron 36" Paper Rollers.

**THOMAS W. HALL COMPANY, INC.**
120 West 42nd St., New York 18, N. Y.
TF

## FOR SALE

**45" & 55" Seybold Paper Cutters**
**48" Meisel Spot Sheeter with Layboy**
**50" Waldron Brush Coater & Polisher**
**65" Waldron Drum Rewinder**
**32", 40", 52" Coaters & Spreaders**
**56" Miehle Printer & Die Cutter**
**65" Babcock Die Cutter**
**58" Kidder Slitter & Rewinder—3 Arm**

**Also Set-up, Folding & Corrugated Box Machines of Standard and Well Known Makes.**

**Write for listing on other Paper Converting Items available. Our Rebuilt machines are guaranteed to give service equal to new machines.**

**SOUTH WABASH ENGINEERING CO.**
**2937 S. Wabash Ave., Chicago 16, Illinois**
J-14

**FOR SALE**

**New and guaranteed used steel pipe, boiler tubing, valves, fittings, wood and steel tanks, steel buildings**

**JOS. GREENSPON'S SON PIPE CORP.**
**NATIONAL STOCK YARDS, Illinois.**
S-6

**FOR SALE**

20 dryers in very good condition, 5 ft. dia. x 170" face with gears 110 teeth 2 pitch, 5 to 7" face, also 23 felt rolls 12" dia. x 175" face and 16 frames.
1 Mack trailer, model 16 ST. serial number 2x2147, tank size 3250 gallons. Oval cross section 15 ft. long steel tank, 3" cork insulated.
1 Combination top and bottom Bliss stitcher for sealing boxes.
1 Bliss double head assembly stitcher, new in 1936.

**Frank H. Davis Co.**
**175 Richdale Ave., Cambridge 40, Mass.**
J-21

## FOR SALE

**FOR SALE**

**1—Complete 98" Fourdrinier Paper Machine with 26 Dryers, 48" diameter x 96" face, including auxiliary equipment. Additional details on request.**

**J. J. ROSS COMPANY**
**250 Frelinghuysen Ave., Newark 5, N. J.**
**Telephone Bigelow 3-3720**

PAPER COATING MACHINERY — Waxing Oiling, Gumming, Gluing, Carbon, Laboratory Coating and Treating Machines. High speed. New improvement. MAYER MACHINE COMPANY, Inc., 1155 Scottsville Road, Rochester, 11, N. Y. TF

## GOVERNMENT BIDS

PROPOSALS

FOR FURNISHING

PAPER AND ENVELOPES FOR THE U. S. GOVERNMENT PRINTING OFFICE

SEALED PROPOSALS will be received until 10 A.M. June 11, 1945, in the room of the Joint Committee on Printing, in the Capitol, Washington, D. C., for furnishing the paper for the public printing and binding, and blank paper and plain envelopes for the use of the Government departments and establishments in the District of Columbia, for the terms of 3 months for paper and 6 months for envelopes beginning July 1, 1945, deliveries to be f. o. b. Government Printing Office Warehouse, or warehouse siding, Washington, D. C. The proposals will be opened in the presence of and the award of contracts made by the Joint Committee on Printing to the lowest and best bidders for the interest of the Government whose bids are in conformity with the requirements of the proposals. The Committee reserves the right to reject any or all bids, or to accept any bid or any part and reject the other part, if, in its opinion, such action would be in the interest of the Government.

Blank proposals containing the instructions, schedule, and specifications, may be obtained by addressing A. E. Giegengack, Public Printer, Washington, D. C.

Contracts will be entered into for supplying the quantities required, whether more or less than the estimates, as provided in paragraph 15 of the proposal for paper and paragraph 13 of the proposal for envelopes.

The approximate estimated quantities set forth in detail in the schedules comprise:

PAPER

2,500,000 pounds newsprint paper; 400,000 pounds telephone booknews; 2,430,000 pounds machine-finish book paper; 4,000,000 pounds offset book paper; 150,000 pounds antique book paper; 40,000 pounds lightweight machine-finish book paper; 50,000 pounds 50% antique book paper; 1,000,000 pounds supercalendered book paper; 1,650,000 pounds machine-coated book paper; 400,000 pounds coated book; 4,300,000 pounds mimeograph paper; 450,000 pounds duplicator copy paper; 200,000 pounds U S M O safety writing paper; 19,200,000 pounds writing paper; 2,730,000 pounds map paper; 745,000 pounds manifold paper; 3,550,000 pounds bond paper; 650,000 pounds ledger paper; 2,480,000 pounds index paper; 60,000 pounds cover paper; 140,000 pounds manila paper; 700,000 pounds kraft paper; 600,000 sheets white gummed paper; 125,000 pounds blotting paper; 10,000 sheets high-finish red sulphite; 160,000 pounds tag board; 60,000 pounds manila cardboard; 10,000 sheets railroad board; 150,000 pounds tan board; 500,000 pounds wood cardboard; 3,900,000 pounds postal card paper; 30,000 sheets red pressboard; 300,000 pounds news board; 315,000 pounds binder's board; 80,000 pounds chestnut coverboard.

In cases where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

ENVELOPES

20,200,000 kraft; 9,000,000 writing, chemical wood, white and colored; 200,000 100% writing, white; 1,110,000 25% bond, white, 275,000 100% bond, white.

By direction of the Joint Committee on Printing.

A. E. GIEGENGACK,
*Public Printer.*

WASHINGTON, D. C.,
*May 28, 1945.* J-7

FOR SALE FOR SALE

# by JACK ROSS PAPER MACHINERY CO.

**17 Porter Avenue, Newark 8, N. J.**

**Waverly 3-5675**

*Actual Photo*

**Farrel Roll Grinder, will take rolls 28" diameter x 18' long. Equipped with 2—10 h.p. and 1—15 h.p. motors including all starting equipment.**

1—Improved Paper Machinery Company 3 roll Hydraulic Wet Machine. Cylinder Mold 36" diameter 84" face. Complete with enclosed drive. Prints and photos on request. Used 1 year.
2—Pusey & Jones Horizontal Digesters. Welded equipment with Logan Circulators. 24' high x 7' diameter. 125# working pressure. Prints on request.
1—Guyton-Cumfer Saturator. Tank 50" wide. 5 gates complete. Prints on request.
1—Waterbury Hydraulic Variable Speed Transmission. Size 50—Type C. Maximum HP 50. Maximum RPM 400.
1—Moore & White Flat Screen. 16 plates 12" x 24" .015 cut.
1—Moore & White Flat Screen. 20 plates 12" x 24" .015 cut.
1—Packer Flat Screen. 10 plates 12" x 42" .015 cut.
1—36" diameter x 84" face Cylinder Mold. New backing wire. New face Wire. 65 mesh. Extra heavy construction.
1—2" to 6" Outer Pipe Threading Machine. Direct connected to motor 440-3-60.
2—#3 Vertical Reeves Drives totally enclosed—ball bearing equipped. Ratio 3:1. Used year and a half.
1—15 h.p. Reliance Motor 220-440-1750 R.P.M. Ball bearing. Used year and a half.
4—Driers—112" face x 48" diameter complete with 2 deck frames, gears, etc.
2—Norwood Engineering Co.—44" two roll platers direct connected to 15 h.p. motors.
1—60" Voith Inlet.
1—A. D. Wood Sewall—cylinder—60" face by 48" diameter—ball bearing equipped—rebuilt—specifications on request.
1—No. 1 Voith Pulper—capacity 20 tons per day—requires 20 h.p.
1—42" Liner and combining machine. Fourteen 6" diameter steam heated rolls and one drier 24" diameter.
3—Improved Paper Machy. Corp. #2 Knotters Bronze fitted. Good condition. Prints on request.
1—#2 Miami Jordan ¾ bronze fillings for direct connection to motor.
2—14" x 20" Connersville Vacuum Pumps. These pumps are fully rebuilt.
3—12" x 18" Connersville Vacuum Pumps. These pumps are fully rebuilt.
1—Downingtown 2500 lb. Iron Tub Cyclone Beater. Beater rolls 60" face, 72" diameter. This beater is in excellent condition, having been in operation less than 2 years. Prints on request.
2—Holyoke Platers—2 roll, 30" face x 18" diameter—complete with drive.
1—Nichols-Herreshoff Lime Kiln—vertical 65 tons capacity. Prints on request.
1—72" two drum Pusey & Jones Slitter & Winder will rewind 40" diam. rolls.
1—100" two drum Warren Slitter & Winder.
1—100" Two Bowl Reel—Bowls 20" diam.
1—E. D. Jones Standard Jordan with fast coupling and extended base for direct connection to motor.
1—Farrel Roll Grinder will take rolls 28" diam. 18' long. Motor equipped. 2—10 h.p. Motors. 1—15 h.p. Motor—Excellent condition. Photos on request.
1—136" Moore & White 4 drum uniform speed slitter & winder. 5 sets of King type slitters.
1—Williams #30 type G. A. Bark Hog with 125 h.p. Synchronous motor. Ball bearing equipped and new spare parts—used one year.
1—Sumner Disc Barker—72" diam. disc. Anti-friction bearings. Direct connected 30 h.p. motor. Used 5 months.
1—140" two drum Warren Slitter & Winder.
45 Driers—60" face x 28" diameter complete with 2 deck frames, gears and bearings.
1—Sturtevant Bale Pulper with conveyor complete with 150 h.p. motor and starter.
8—10" x 20" Shartle Brothers Triplex Stock Pumps.
1—12" x 20" Shartle Brothers Triplex Stock Pumps.
1—8" x 18" Shartle Brothers Triplex Stock Pumps.
1—8" x 10" Worthington Triplex Stock Pumps.
3—12" x 12" Gould's Triplex Stock Pumps.
2—6" x 8" Beloit Centrifugal Stock Pumps.
All above pumps in excellent condition.
2—1000 lb. Horne Iron Tub Beaters.
1—1200 lb. Holyoke Wood Tub Beater.
1—56" Cameron Laminating Machine equipped with steam drying rolls and Cameron Rewinder, used 2½ years. Photos on request.
1—124" Hamblet Single Knife Sheeter, with Hamblet layboy, overlapping delivery, 4 piles, with blower.
1—Trimbey Pulp Screen perforations. 000—30 tons capacity.
18 Driers—30" diameter—82" face—2 deck frames, gears and bearings.
6 Driers—36" diameter—82" face.
4 Sets of Press Rolls 18" diameter—87" face.
1 Set of Size Press Rolls—84" face—16" diameter.

**Cash purchaser of all types of paper, pulp and converting equipment.**
**From single items to complete plants.**

**Write, telephone or wire whatever you have for sale.**

# FOR SALE

**BEATERS**
2—2000 lb. Holyoke Iron Tub Beaters.
1—1000 lb. Dayton Beater.
2—400 lb. Gavit—iron tub beaters.

**BLOWER**
1—50" Buffalo.
*Various other sizes.*

**CALENDER STACKS**
1—11-Roll 92" Face Calender Stack—complete with Drive.
1—36" 7-roll—Holyoke Machine.
1—77" 2-roll—Moore & White.
1—84" 5-roll—Black-Clawson.

**CENTRAP**
1—Shartle Brothers Centrap.

**CYLINDER MOULDS**
1—48" Diameter x 96" Face.
8—30" diameter x 72" face.
3—30" diameter x 74" face.

**DRIVES**
1—D. O. James 75 H.P. Speed Reducer with couplings and motor base. Ratio 2.16 to 1. 900 RPM to 418 RPM.
1—#6 Reeves Drive (practically new).
1—Pulmax Drive.

**DRYERS**
1—48" diameter x 94"face.
1—24" diameter x 84" face. (Baby).
1—16" diameter x 84" face. (Baby).
1—36" diameter x 116" face.
2—28" diameter x 68" face.

**EMBOSSER**
1—28" two roll Embossing Calender.

**ERKENSATORS**
3—I. W. E. Erkensators—bronze construction—complete with motors, starters and distributing box.

**FLAT SCREENS**
2—8 plate Flat Screens.
1—18 plate Flat Screen, with scraper.

**JORDANS**
1—Pony Horne Jordan. Spare New Fillings.
1—Black-Clawson Jordan (belt driven).
1—#9 Emerson Jordan—for direct connection of a motor — requires use of 400 H.P. motor.
1—Smith & Winchester.

**PULP EQUIPMENT**
1—84" Carthage Chipper—complete and in excellent condition.
1—32" three pocket Glens Falls Grinder (for 27" wood).
3—Rotary incinerators—9' diameter x 20' long.
4—27" four pocket Sandy Hill grinders (for 24" wood—including 1000 H.P. motor for each, starting equipment, etc.).

**PULPERS**
1—#2 Lannoye Pulper.
1—Jones Pulper — direct connected to 60 H.P. motor—3 phase, 60 cycle, 440 volts —forward and reverse starting.

**PUMPS**
1—Buffalo Pump—5500 g. p. m., direct connected to 100 H.P. Motor (50' head).
*Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.*

**REELS**
1—2 Bowl Reel — 112" face — bowls 20" diameter.
1—2 Bowl Reel—63" face.
1—2 Bowl Reel—110" face.

**REFINERS**
2—#1 Claflin Refiners.

**ROLLS**
500—Brass tube—steel tube—rubber covered iron rolls—various sizes.

**RUBBER COUCH ROLL**
1—72½" Face x 9" diameter (soft rubber).

**SAVEALLS**
1—Shartle Bros. decker 36" diameter x 60" face, including couch roll.
1—North Saveall—cylinder mould 72" diameter x 100" face.

**SHREDDERS**
1—#25 CRSE Mitts & Merrill Hog.
1—Gilman Shredder—used one year.
1—Taylor Stiles #5 Pulp Shredder.

**SHEETERS**
1—110" Horne single knife rotary sheet cutter.
1—48" Langston heavy duty chopper (this is a combination machine, combining a slitter, scorer, sheeter and chopper.)

**SIZING MACHINE**
1—36" Waldron sizing machine.

**SLITTERS**
1—114" Two drum Langston Slitter & Winder.
1—110" Beloit slitter (slitter attachment only).
1—114" Two drum Kidder slitter and winder.
1—36" Koegel slitter and winder.
1—44" Langston heavy duty slitter & winder.

**SUCTION BOXES**
1—Nash 100" face Suction Box.
3—Brass Suction Boxes—90" drilled face.
2—Brass Suction Boxes—77½" drilled face.

**SUCTION COUCH ROLL**
1—Sandusky Suction Couch Roll — 18" diameter x 130" face — Complete with Sturtevant Vacuum Pump and drive mechanism.

**SUCTION PRESS ROLL**
1—Sandusky suction press roll, 14 1/16" diameter x 68" drilled face.

**WINDERS**
2—65" Cameron Tensions for Winders.

**J. J. ROSS CO., 250 Frelinghuysen Avenue, Newark 5, New Jersey**
TEL. BIGELOW 3-3720 J-7

We are always in the market to purchase your surplus or idle machinery. What have you to offer?

## FOR SALE

**FOR SALE**

1—60 H.P. Fairbanks Morse Diesel Engine, connected to a 40 KVA Generator.

1—100 H.P. Ames Steam Engine, connected to a 75 K.W. Westinghouse Generator.

1—150 H.P. G. E. Induction Motor — 3/60/220—875 r.p.m.—including starting equipment.

**J. J. ROSS COMPANY**
250 Frelinghuysen Ave., Newark 5, N. J.
Bigelow 3-3720 J-7

## FOR SALE

2—Horne iron tub beaters
2—Jordans 49" plugs
2—Beloit 8" x 6" fan pumps
1—Shartle 8" x 18" duplex stuff pump
4—12" x 12" Gould triplex stuff pumps
1—8" x 10" Worthington triplex stuff pump

**Shartle Brothers Machine Co.**
Middletown, Ohio
J-14

FOR SALE—1 Hamilton-Corliss Variable Speed Twin Engine, size of cylinders 12" x 24". Also Triple-Deck Frames for ninety 36" dryers, any width. The Chesapeake Paperboard Co., Baltimore, 30, Md. TF

FOR SALE—1-84" L. H. 4 Knife Carthage Chipper complete with square spout and Knives. Good condition. Wolf River Paper & Fiber Co., Shawano, Wisconsin. J-7

## FOR SALE

**FOR SALE**

36" Sheridan "New Model" Automatic Power Cutter.
44" Oswego hand clamp Power Cutter
44" Seybold Holyoke Auto. Power Cutter.
63" Oswego Mill Type Cutter, power back gauge.
66" Clark Sheeter with Back Stand
110" Hamblet heavy duty Sheeter with backstand.
68" Rice Barton & Fales Slitter & Rewinder, for use on dry end of paper machine.
120" Moore & White 4-drum Rewinder.
36" Waldron Embosser.
4 Waldron 36" Paper Reels.

**THOMAS W. HALL COMPANY, Inc.**
120 West 42nd St., New York 18, N. Y.
TF

## FOR SALE

42 Dryers consisting of 85" and 86" face—36" diameter—complete with triple deck stands, gears, bearings and piping.

One Set (70) Heat Treated Carbon Steel Flybars together with woods for a 62" diameter by 50" face Dilts Bandless Beater Roll.

**EMPIRE BOX CORPORATION**
Garfield, New Jersey TF

## FOR SALE

**FOR SALE**

1—18"x20" Beloit Triplex Stock Pump.
1—7-Roll 48" wide Holyoke Super Calender Stack, complete with 50 H.P. G. E. a.c. 3 phase 60 cycle, 220 volt motor equipment. Machine in perfect condition.
1—84" Pusey & Jones Wet Machine, 36" diameter cylinder mould including vat.
1—Noble & Wood Mammoth Jordan with new shell and plug fillings.
Complete line of self-opening bag machines from ½ to 35 lbs. Also, flat and square bag machines from ½ to 20 lbs.
3—Beloit Triplex Plunger Stock Pumps, size 8" x 12", 9" x 12" and 10" x 10".
1—#2 Lannoye Pulper complete with 40 H/P A.C. motor equipment, A-1 condition.
1—48" Seybold Holyoke Power Paper Cutter
1—110" Double-Drum Waldron late type shear cut hydraulic Slitter and Rewinder.
4—1500-lb. Thorsen Hory Beaters equipped with 150 H/P A.C. motors and speed reducers.

**GIBBS-BROWER COMPANY, INC.**
21 East 40th St., New York 16, N. Y.
TF

## CAPITAL NEEDED

**MEXICO**

Pulp & Paper Mill nearing completion expected operating January next, initial production 25 tons wrapping paper from semicooked sulphite pulp, plenty pulp wood available cheap power secured, Mexican Government tax exception privilege, wants partner investing 206,000.00 dollars against 25% (equivalent to one million Mexican pesos) of Company's stock. Present partners committing themselves to pay 15% preferential annual dividend on this investment. Write or cable Ingeniero H. V. Lapointe, Apartado 227, Mexico City. J-14

# FOR SALE

3—14 x 14 x 16 Erie Ball variable speed engines
1—15½ x 15½ x 16 Ames variable speed engine
1—114" Paster
2—Black-Clawson #2 Jordans
1—Noble & Wood Monarch Jordan
2—Bahr Bros. Jordan Plugs for Noble & Wood Monarch Jordan
1—Jordan Plug for Noble & Wood Pony Jordan, ¼" filling
2—Miami #6 Jordan plugs, ⅜" duplex fillings
2—Miami #1 Jordan plugs 3/16" fillings
1—Miami #2 Jordan plug, ½" filling or 3/16" duplex filling
2—Jones Majestic Jordan plugs, 5/16" fillings
1—Noble & Wood Jordan plug, Taylor Wharton type
1—Miami #2 Jordan plug for ⅜" duplex filling
1—Air compressor, Laidlaw Dunn 700 cu. ft. 100# pressure, size 18 x 12 x 12 two-stage
1—Air compressor 10 x 16 x 12 x 12—Capacity 840 cu. ft. at 85# pressure. Steam driven.
1—Bandless beater roll 60 x 60 with or without lighter
2—Sets Noble & Wood heavy duty beater lighters with bearings.
2—Sets Bolton assembled shell filling, ¼" bars, for Noble & Wood Monarch Jordan.
1—same as above, 3/16" filling
1—Bahr Bros. shell filling for Noble & Wood Pony Monarch Jordan
1—Bahr Bros. shell filling for Mammoth Jordan
1—Bahr Bros. shell filling for Miami #2 Jordan
1—Bahr Bros. shell filling for Noble & Wood Monarch Jordan
1—Powell single head planer, 37" between housings
1—Buffalo Duplex Conodial Blower, size 8
1—8-plate Packer screen
1—#2 Lannoye Pulper
1—Turbine driven Frederick 10 x 8 water pump, 2500 G. P. M., 95' head. Turbine is a Murray 75 H. P., 150# pressure.

**SHARTLE BROS. MACHINE CO.**
**MIDDLETOWN, OHIO**

J-14

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**FOR SALE**
2—63" Dietz Toilet Converters.

**J. J. ROSS COMPANY**
250 Frelinghuysen Ave.
Newark 5, N. J.
Telephone Bigelow 3-3720

J-7

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**MOBILE STORAGE**
15—50 ft., 50-Ton, Steel Automobile Box Cars. 4347 cubic feet capacity. Excellent for mobile storage or transfer of light bulky commodities. Prompt delivery.

**IRON & STEEL PRODUCTS, INC.**
40 years' experience
13420-A S. Brainard Ave., Chicago 33, Ill.
*"ANYTHING containing IRON or STEEL"*

J-21

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FOR SALE—Brownell Twin Steam Engine, 12" bore, 14" stroke, Maximum steam pressure 175 pounds. Belt wheel 66" diameter, 19" wide. In excellent condition. Ready for immediate shipment. Address Box 45-303 care Paper Trade Journal. J-14

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FOR SALE—50" Seybold Automatic Clamp Cutter, thoroughly rebuilt and fully guaranteed. Address Box 45-333 care Paper Trade Journal.

J-7

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**Appleton Wires are Good wires**
APPLETON WIRE WORKS, INC. APPLETON, WIS.

---

**PULP MILL MACH'Y FINISHING ROOM MACH'Y**
**FRICTION CLUTCHES**
THE MOORE & WHITE CO.
PHILADELPHIA, PA.
N. PHILA STA. PENNA R.R.
PAPER MILL MACHINERY

---

**MISCO "C"**
THE CORROSION RESISTANT ALLOY
**CAST • ROLLED • FABRICATED**
*for all equipment exposed to corrosion by sulphite acids*
MICHIGAN STEEL CASTING CO., DETROIT 7, MICH.

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**Appleton Felts**
MAKE GOOD PAPER
APPLETON WOOLEN MILLS
APPLETON, WISCONSIN

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**CAMACHINE 18**
Winder or Rewinder

**Over 200 of This One Type in Operation**
Built in widths up to 162"
Speeds up to 2,000 F.P.M.
CAMERON MACHINE CO., 61 Poplar St., Brooklyn 2, N. Y.
Midwest Office: 111 West Monroe St., Chicago 3

# WHERE TO BUY

**ABRASIVES**
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Monsanto Chemical Co.
Norton Co.

**ADHESIVES**
American Resinous Chemicals Corp.
Arabol Mfg. Co.
National Adhesives Division of National Starch Products, Inc.
Philadelphia Quartz Co.
Stein, Hall & Co., Inc.
United States Rubber Co.

**AGITATORS**
Appleton Machine Co.
Dilts Machine Works, Inc.
Dorr Company
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
H. K. Porter Company Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

**BAG MACHINES**
Thomas W. Hall Co., Inc.
Pendevin Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Weber, Herman G.

**BARKERS AND CHIPPERS**
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

**BARS**
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.
The Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

**BEARINGS**
Black-Clawson Company
Jones, E. D. & Sons Co.
The Manhattan Rubber Mfg. Co
Montague Machine Works
Railway Bearing Co.
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
SKF Industries Inc.
Timken Roller Bearing Co.
Valley Iron Works Co.
T. B. Woods' Sons Company

**BEATERS & JORDANS**
The Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Herman Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
J. J. Ross Company
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

**BED PLATES**
Bahr Brothers Mfg. Co.
Dilts Machine Works Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

**BELTING**
Allis-Chalmers Mfg. Co.
The Cincinnati Rubber Mfg. Co.
Graton & Knight Company
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
J. E. Rhoads & Sons
United States Rubber Co.
T. B. Wood's Sons Company
Worthington Pump & Machinery Corp.

**BLEACHING APPARATUS**
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
Noble & Wood Machine Co.
Pennsylvania Salt Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

**BLOW PIPES & PITS**
Montague Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company
Valley Iron Works Co.

**BOTTOMS**
Harrington & King Perforating Co.
Kalamazoo Tank & Silo Co.

**CALENDERS**
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Waldron Corp., John

**CASEIN**
Packing Products Co.

**CASTINGS**
Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Fort Pitt Steel Casting Co., Div. H. K. Porter Company, Inc.
The Frederick Iron & Steel Co.
Grinnel Company
Hamblet Machine Co.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Magnus Metal Corp.
Montague Machine Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Smith & Winchester Mfg. Co.
Traylor Engineering & Mfg. Co.
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.
Walworth Company

**CENTRIFUGAL MACHINERY**
Bird Machine Co.
De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp.
Ross J. O. Eng. Co.
Shartle Brothers Machine Co.

**CHEMICALS**
Aktivin Corporation
Amer. Cyanamid & Chem. Corp.
American Resinous Chemicals Corp.
Ansul Chemical Co.
Calco Chemical Co.
Diamond Alkali o.
Disperaion Process Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Geigy Co., Inc.
Gottsman & Co.
Hooker Electrochemical Company
The Mathieson Alkali Works, Inc.
Monsanto Chemical Company
The Neville Company
National Oil Products Co.
Naugatuck Chemical Div. of U. S. Rubber Co.
Niagara Alkali Company
Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Co.
Pioneer Salt Company
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Stauffer Chemical Company
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemicals Corp.

**CLEANING MATERIALS**
Amer. Cyanamid & Chem. Corp.
Bird Machine Co.
E. I. du Pont de Nemours & Co., Inc.
Oakite Products, Inc.
Paper Makers Chemical Department, Hercules Powder Co.
Magnus Chemical Co.
Nichols Engrg. & Research Corp.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp.
J. B. Ford Division

**CLUTCHES**
Appleton Machine Co.
Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc.
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Stearns Magnetic Mfg. Co.
Valley Iron Works Co.
T. B. Wood's Sons Company

**COATING MACHINERY**
Hudson Sharp Machine Company
Moore & White Co.
Pendevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G.

**COMPRESSORS**
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machinery Corp.

**CONSTRUCTION ENGINEERS**
Merritt-Chapman & Scott Corp.
Rust Engineering Company

**CONSULTING ENGINEERS**
W. H. L. D. Betz
Frederic C. Clark
Ferguson, Hardy S.
Hardy, George F.
Johnson & Wierk, Inc.
The Kohler System Company
Main, Inc., Chas. T.
J. E. Sirrine & Co.
Stone & Webster Engrg. Corp.

**CONTROLS**
The Bristol Company

**CONVEYORS**
Black-Clawson Company
Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.

**CORES**
Elixman Paper Co.
Sonoco Products Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Walker-Goulard-Plehn Co.

**COUPLINGS**
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
The Frederick Iron & Steel
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Corporation
T. B. Wood's Sons Company

**CUTTERS**
Thomas W. Hall Co.
Noble & Wood Mach. Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
Taylor Stiles & Co.

**DAMPENERS**
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

**DE-INKING**
Kindey Chemical Co.

**DIGESTERS**
The Biggs Boiler Works Co.
H. K. Porter Company Inc.
Pusey & Jones Corp.

**DOCTORS**
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

**DOCTOR BLADES**
Black-Clawson Company
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Simonds Worden White Co.
Shartle Brothers
United States Rubber Co.
Westinghouse Electric Corporation

**DRIERS**
Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross, J. O. Engineering Corp.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

**DRIVES**
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric Corporation

**DUSTERS**
Appleton Machine Co.
Downingtown Mfg. Co.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg Co.
D. J. Murray Mfg. Co.

**DYESTUFFS**
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

**EVAPORATORS**
Black-Clawson Company
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Traylor Engineering & Mfg. Co.

**FANS**
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

**FEEDERS**
Builders-Providence, Inc.
Merrick Scale Mfg. Co.
Leeds & Northrup
Traylor Engineering Co.
Wallace & Tiernan

**FELTS**
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co. Inc.
Draper Bros. Corp.
Fitchburg Duck Mills
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Woodward, Baldwin & Co.

**FELT GUIDES**
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

**FILLERS**
American Colloid Co.
Amer. Cyanamid & Chem. Corp.
American Resinous Chemicals Corp.
International Pulp Co.
W. H. Loomis Talc Corp.
Union Talc Co.
Vanderbilt Co., R. T.
Witco Chemical Co.

**FILTERS**
Moore & White Co.
J. O. Ross Engrg. Corp.
Worthington Pump & Mchy. Corp.
Witco Chemical Co.

**FLOORING, GRATING & TREADS**
Hendrick Mfg. Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
United States Rubber Co.

**FORMING MACHINES**
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

# WHERE TO BUY

**GEARS**
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

**GRINDERS**
Cavel-Hanchett Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

**GRINDING WHEELS**
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Simonds Worden White Co.
United States Rubber Co.

**HEATING, VENTILATING AND AIR CONDITIONING**
The Appleton Machine Co.
Armstrong Machine Works
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Valley Iron Works Co.
Worthington Pump & Mchy Corp.

**HOISTS**
Appleton Machine Co.
Dilts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

**HOSE (Air, Water, Suction, etc.)**
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

**INSTRUMENTS, TESTING AND MEASURING**
W. H. & L. D. Betz
M. P. Bowsher
The Bristol Company
Builders-Providence, Inc.
The Foxboro Company
General Electric
W. & L. E. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taber Instrument Corp.
Taylor Instrument Cos.
Wallace & Tiernan Co., Inc.

**JORDAN FILLINGS**
Appleton Machine Co.
Behr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

**KNIVES**
Black-Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Simonds Worden White Co.
Valley Iron Works Co.

**LABORATORY EQUIPMENT**
Appleton Machine Co.
W. H. & L. D. Betz
Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Valley Iron Works Co.

**LAY BOYS**
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

**LUBRICANTS**
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

**LUBRICATORS**
Hills-McCanna Co.

**MICROMETERS & CALIPERS**
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Car Wheel Co.
Walker-Goulard-Plehn Co.

**MIXERS**
Youngstown Welding & Engrg. Co.

**MOISTENING EQUIPMENT**
The Spray Engineering Co.

**MOTORS AND GENERATORS**
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corporation

**PACKING BOXES**
Johnson Corporation
Shartle Brothers Machine Co.

**PACKING**
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

**PAPER MACHINES**
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

**PAPER MACHINE SLICES**
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

**PAPER TUBE MACHINERY**
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

**PASTING MACHINES**
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

**PERFORATED METAL**
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

**PIPE**
Black-Clawson Company
Crane Company
Grinnell Company
Shartle Brothers Machine Co.
Taylor Forge & Pipe Works
Walworth Company
Youngstown Welding & Engrg. Co.

**PLATERS**
Perkins & Son, Inc., B. F.

**PLATES**
Black-Clawson Company
Hendrick Mfg. Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

**PLUGS**
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

**PRESSES**
Black-Clawson Company
Farrel-Birmingham Co.
Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer C.

**PUG MILLS**
Traylor Engineering & Mfg. Co.

**PULPS**
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc.
Castleman & Co., Inc.
Elof Hanson, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

**PUMPS**
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Frederick Iron and Steel Co.
Hills-McCanna Co.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
Quimby Pump Co. Div. of H. K. Porter Company, Inc.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Company
Worthington Pump & Machinery Corp

**RECOVERY SYSTEMS**
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp. J. O.
Valley Iron Works Co.

**RECTANGULAR BINS**
Traylor Engineering & Mfg. Co.

**REELS**
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

**REFINERS**
Appleton Machine Co.
Behr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
The Hermann Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Rubber Corp.
Valley Iron Works

**REGULATORS**
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Bristol Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Taylor Instruments Companies
Wallace & Tiernan
Westinghouse Electric Corporation

**RESINS**
American Cyanamid & Chemical Corp.
American Resinous Chemicals Corp.
The Resinous Products & Chemical Co.

**ROLLS**
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
Rochlen Engraving Co.
J. J. Ross Company
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

**ROLL COVERS**
The Cincinnati Rubber Mfg. Co.
Youngstown Welding & Engrg. Co.

**ROLL STANDS**
Cameron Machine Co.
Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

**ROTARY KILNS**
Traylor Engineering & Mfg. Co.

**SATURATING MACHINES**
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

**SCALES**
Builders-Providence, Inc.
Merrick Scale Mfg. Co.

**SCREEN PLATES**
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

**SCREENS**
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.

**SCRUBBERS**
Traylor Engineering & Mfg. Co.

**SHEET MACHINES**
Thomas W. Hall Co.
The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

**SHOWER PIPES**
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

**SHREDDERS**
Bauer Brothers Co.
Carthage Machine Co.

**SIZING**
American Cyanamid & Chemical Co.
American Resinous Chemicals Corp.
Black-Clawson Company
The Dow Chemical Co.
du Pont, E. I., de Nemours & Co.
National Oil Products Co.
Paper Makers Chemical Department, Hercules Powder Co.
Pioneer Salt Company
Socony-Vacuum Co.
Philadelphia Quartz Co.

**SLITTERS**
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Johnstone Eng. & Machine Co.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Simonds Worden White Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

**SPRAY NOZZLES**
The Spray Engineering Co.

**STAINLESS STEEL**
Eastern Stainless Steel Corp.
Industrial Steels, Inc.

**STARCH**
American Cyanamid & Chemical Corp.
Clinton Co.
National Starch Products, Inc.
Stein, Hall & Co., Inc.

## WHERE TO BUY

**STEAM SPECIALTIES**
Johnson Corp.
Shartle Bros. Mch. Co.
Stubbs Steam Specialties Co.

**STRAPPING & STRAPPING MACHINES**
The Stanley Works

**STUFF CHESTS**
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

**SUCTION BOXES**
Black-Clawson Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Westinghouse Electric Corp.

**SULPHUR**
American Cyanamid & Chemical Corp.
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

**SULPHUR BURNERS**
Valley Iron Works Co.

**TALC**
American Cyanamid & Chemical Corp.
W. H. Loomis Talc Corp.
International Talc Company

**TANKS**
Penstock Mfg. Co.
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Noble & Wood Machine Co.
M. K. Porter Company Inc.
Rodney Hunt
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.

Traylor Engineering & Mfg. Co.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co.

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Bulkley, Dunton Pulp Co. Inc.
Casthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

**TITANIUM**
E. I. Du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

**TOOLS**
Acme Steel Company
Ingersoll-Rand Co.
The Stanley Works
Walworth Company

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Wright-Hibbard Ind. Elec. Truck Co.

**TRAPS**
Armstrong Machine Works
Crane Co.
Grinnel Company
Johnson Corporation
Shartle Bros. Mch. Co.

**TUBS**
Rodney Hunt Machine Co.
Noble & Wood Machine Co.
Shartle Brothers
Valley Iron Works Co.

**TURBINES**
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Company
Hunt, Rodney, Mach. Co.
Westinghouse Electric Corp.
Worthington Pump & Machinery Corp.

**USED EQUIPMENT**
Frank H. Davis Company
Gibbs-Brower Co.
Thomas W. Hall Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Shartle Brothers Machine Co.

**VALVES**
The Bristol Company
Crane Company
Dilts Machine Works
The Foxboro Company
Hills-McCanna Co.
E. D. Jones & Sons Co.
Kennedy Valve Mfg. Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Permutit Company
William Powell Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Taylor Instrument Companies
Valley Iron Works Co.
Walworth Company

**VATS & VAT PARTS**
Union Machine Co.
Union Screen Plate Co.

**WASHERS**
Bird Machine Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

**WATER CONDITIONING**
The Permutit Company

**WAXING MACHINERY**
Black-Clawson Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

**WELDING EQUIPMENT**
Allis-Chalmers Mfg. Co.
General Electric Company
Walworth Company
Westinghouse Electric Corp.

**WET MACHINES**
Black-Clawson Co.
Carthage Machine Co.
Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

**WINDERS AND REWINDERS**
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co.
Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
Johnstone Eng. & Machine Co.
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

**WIRES**
Appleton Wire Works
Black-Clawson Company
Bulkley, Dunton Pulp Co. Inc.
Cheney Bigelow Wire Works
Hayden Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Shartle Brothers Machine Co.

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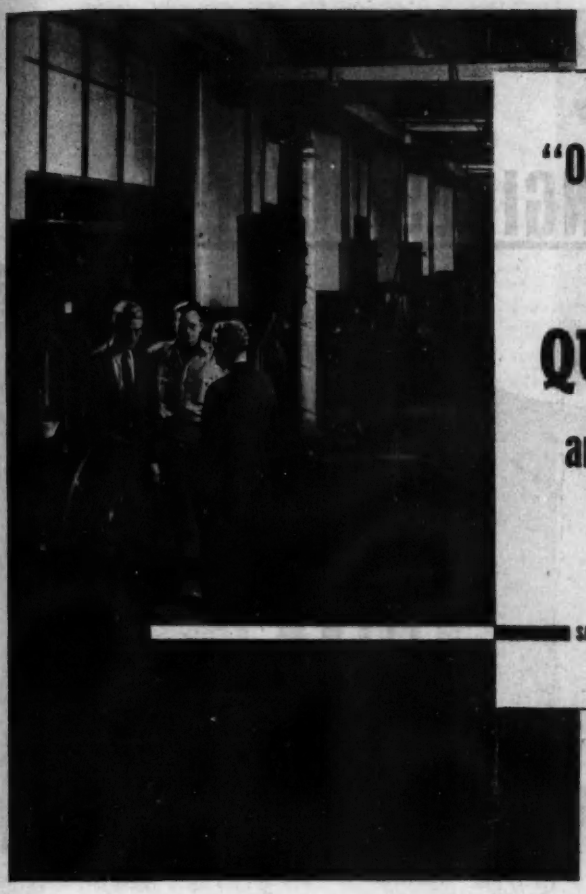

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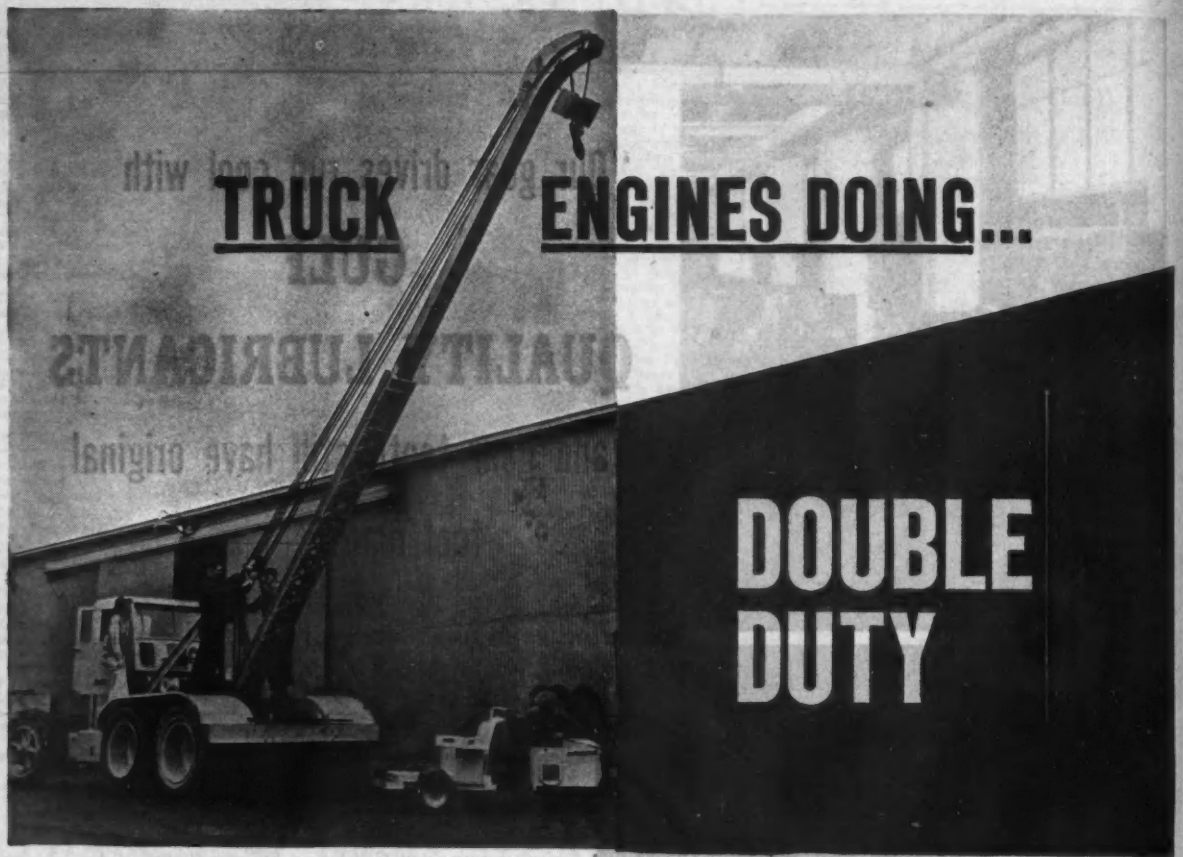


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